LAST MINUTE
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News From Oil Industry Everywhere

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SAYS 'DUMMIES' CUT PRICE FOR BIG COMPANIES

By Telegraph

DETROIT, Aug. 24.—Dummy oil companies were assailed as the root of Detroit's discount evil at a meeting of the Retail Gasoline Dealers Association of Michigan Inc., attended by about 400 dealers here last night. Rankin P. Peck, association secretary, who made the charge, said that these dummy oil companies are set up by certain major oil companies for the express purpose of selling gasoline to motorists at a discount, thus bringing other dealers down to the same level and eventually increasing the wholesale price without increasing the cost to the motorist. In other words, it means an effort to cut two cents off the dealer's margin, Peck said.

Peck gave an example of the financial structure of one large gasoline retailer offering discounts in Detroit. He asserted that this operator had an initial capitalization of $5000 and was loaned $10,000 additional by his oil company supplier. In addition his buildings and land are mortgaged to the extent of $35,000 and he has several notes standing against him, Peck continued.

Blockades Continue

From the meeting floor Frank Lake, president of local dealers union, defended the union's practice of blockading the drives of discounting stations and stated that this group planned to continue its "worry war." Peck stated he sympathized with the union's objective, but said it was unfortunate that such a method might lead the public and the courts to believe that the dealers are raising prices.

"Under this fair trade law we are not interested in raising prices to the consumer, but simply in protecting the dealer's margin," Peck said.

The prosecution of violators of Michigan's fair trade law came a step nearer realization

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Congress 'Do Nothing' Session Ends

Stream Pollution, Natural Gas Pipeline Control, Naval Oil Reserves And Other Oil Measures Are Held Over; Tydings-Miller Law Enacted

By G. T. KELLOGG
N. P. N. News Bureau

WASHINGTON, August 23.—Gavels banged "finis" to the first session of the Seventy-fifth United States Congress at 7:22 p. m. Saturday, August 21, after one of the longest sessions on record, and, from the standpoint of general legislation, one of the most ineffectual.

In the words of one political observer, "if the session does go down in history, it will not be because of its accomplishments. It will be because of the things it did not do."

The session ended on the same sour note which has been ringing through the halls of the old Capitol building since President Roosevelt first suggested that the lawmakers give him a blank ticket to appoint a half-dozen new Supreme Court justices.

But, with all the recrimination and bickering that marked the seven-and-a-half month sojourn in Washington, the Congress managed to "get together" enough to make appropriations totaling $9,300,000,000.

The session just ended will be remembered, if for no other reason, because with it came the end of the docility that had marked previous New Deal Congresses — while it "went along" with the President on some of his proposals, it refused to swallow some segments of the program which the White House tried to shove down its throat.

The crushing defeat of the President's Supreme Court packing scheme was, of course, the highlight of the session, closely followed by the failure to enact wage-hour legislation

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Resale Price Laws

Text of Tydings-Miller law, which gives federal sanction to resale price maintenance contracts where authorized by state law, is printed on Page 18. A typical state fair trade law, with 41 states listed having such laws, is to be found on Page 18.

'Gas' Dealers Use California's Law On Resale Prices

N. P. N. News Bureau

LOS ANGELES, Aug. 21.—California oil companies so far have made little use of the "teeth" in the state's fair trade law, although several companies include a resale price maintenance clause in their contracts with dealers and other resellers.

Whether approval of the Tydings-Miller law will encourage the oil companies to take more advantage of similar laws in Washington, Oregon, Nevada and Arizona to protect the resale price of their branded

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By Teletype
N. P. N. News Bureau

WASHINGTON, Aug. 24.—President Roosevelt's signing of the District of Columbia tax bill, which gave his reluctant approval to the rider containing the Tydings-Miller bill, has apparently provided an opportunity to protect the resale price of branded contracts on gasoline and motor oils.

Forty-one states now have so-called fair trade laws authorizing contracts by manufacturers and distributors for the maintenance of resale prices. But these laws were not generally used because of the possibility that companies, operating in interstate commerce, might be subjected to prosecution for such contracts under federal anti-trust laws.

This threat has been removed by the Tydings-Miller law which exempts such contracts from the anti-trust laws in those states,

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"Cut My Monthly Crude Allowable, Please, Colonel Thompson"

TULSA, Aug. 21

Regulatory commissions of the principal producing states disagree from time to time with the U. S. Bureau of Mines forecasts of crude oil demand but they do not disagree consistently in the same direction. At times the Bureau is looked upon as too conservative. The current talk is that it is too liberal in its ideas concerning September crude demand.

Hence, it appears as this is written, allowable production orders for September will fall somewhat below the Bureau's forecast of demand issued this week. Texas Railroad Commission's monthly state wide hearing was held Aug. 19 in Austin, with those of Oklahoma and Kansas to come next week.

The Mid-Continent talk now heard is all to the effect that something must be done to escape a reduction in price. Where the prophets were busy six weeks ago setting the date for at least a two-bit advance there remain only those who join the cry for reduction in allowables. Oh, there are a few voices to be heard saying that the price should advance but there are not many of them.

The hearing in Austin was notable for the few requests for increased allowable. Nearly everybody was satisfied to leave things as they are and one op-

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'Gas' Dealers Use California's Law On Resale Prices

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products, remains to be seen.

It was the dealers themselves who first invoked the California fair trade law in an effort to stop another dealer from allegedly selling branded gasoline at less than the retail price designated by the supplying company.

In recent weeks, however, several of the larger oil marketing have indicated that they, too, may take legal steps in the same direction. They have warned chronic "under the canopy" price cutters, who held contracts not immediaely cancellable, to get their prices into line or else face court action for violating the state fair trade law.

This situation has been helped by the fact that in those cases where the disturbing accounts were released, other large marketing companies were not waiting on the sidewalk to sign them up.

One dealer, who had been selling about 40,000 gallons a month of a major company's gasoline at 2 cents off the posted price, had to sign up with a small independent supplier when his contract was cancelled and he could not find another among the major companies.

Dealers Warned

Besides pointing out to their dealers the possibility of suits by injured parties (including their fellow dealers handling the same brand) for violating the fair trade law, some companies have furnished their retail outlets with cards to be hung in the station.

These cards tell the customer about the fair trade law—how it permits the supplier of a commodity bearing a trademark to stipulate the minimum resale price, how any violation of this stipulation is unfair competition and that any person damaged may bring legal action. The customer is asked not to request the station operator to sell at less than authorized prices.

Some of the leading marketing companies include in their resale agreements a price-designation clause. One of these reads, as follows:

"Purchasers shall not resell the branded product of the seller purchased hereunder at less than the minimum price stipulated by the seller from time to time."

Price Stipulated

However, the inclusion of such a clause is not regarded as necessary to bring the reseller under provisions of the fair trade law as all California major marketers have at least one contract in effect which does stipulate the resale price, even though all of the companies do not make it a practice of including a price-designation clause in their contract forms. Under the fair trade law, a single contract specifying the resale price is sufficient to bind all dealers handling the same brand (who are aware of that contract) to maintain the price stipulated.

Although most independent suppliers post authorized retail and tank wagon prices on motor fuel, there has been no definite move so far on their part to enforce adherence to prices under the fair trade law. But it is believed those companies belonging to the Independent Refiners Ass'n. will make more use of the resale-price law and other newer laws, intended to promote fair marketing practices in order to bring about stability in the retail prices of their products.

But it is the dealers who are showing the way. The suit filed by the Retail Petroleum Dealers Ass'n. and a Santa Monica service station operator, named Engle, against Howard Cook, Ocean Park dealer, for allegedly selling Richfield "Q" grade gasoline below the designated price of 18 cents will come up for a preliminary hearing on Sept. 7.

The Ocean Park reseller contends that the gasoline was sold to him under an agents commission agreement in which the products were consigned and that, therefore, he was the supplier's agent and acting for it.

J. Hart Dasteel, attorney for the dealers' association, won the initial skirmish in the first oil case under the fair trade law when the Los Angeles superior court denied a demurrer by the defendant Cook, based on grounds that only Richfield could sue him for allegedly violating the resale price maintenance law. The court also upheld the plaintiff's contention that both the dealers association and Engle were proper parties to the suit.

Forty-one States Now Have Fair Trade Laws

Forty-one states have enacted so-called fair trade laws which authorize the manufacturer or distributor to enter into contracts for the maintenance of resale prices on their branded products. They are:

Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

Following is the text of a typical state fair trade law:

1. The following terms, as used in this act, are hereby defined as follows: (a) "Commodity" means any subject of commerce. (b) "Producer" means any grower, baker, maker, manufacturer, bottler, packer, converter, processor or publisher. (c) "Wholesaler" means any person selling a commodity other than a producer or retailer. (d) "Retailer" means any person selling a commodity to consumers for use. (e) "Person" means an individual, a corporation, a partnership, an association, a joint-stock company, a business trust or any unincorporated organization.

2. No contract relating to the sale or resale of a commodity which bears, or the label or container of which bears, the trade-mark, brand, or name of the producer or distributor of such commodity and which commodity is in free and open competition with commodities of the same general class produced or distributed by others shall be deemed in violation of any law of the state of (name of state where act is to be passed) by reason of any of the following provisions which may be contained in such contract:

(a) That the buyer will not resell such commodity at less than the minimum price stipulated by the seller. (b) That the buyer will require of any dealer to whom he may resell such commodity an agreement that he will not, in turn, resell at less than the minimum price stipulated by the seller. (c) That the seller will not sell such commodity:

(1) To any wholesaler, unless such wholesaler will agree not to resell the same to any retailer unless the retailer will in turn agree not to resell the same except to consumers for use and at not less than the stipulated minimum price, and such wholesaler will likewise agree not to resell the same to any other wholesaler unless such other wholesaler will make the same agreement with any wholesaler or retailer to whom he may resell; or

(2) To any retailer, unless the retailer will agree not to resell the same except to consumers for use and at not less than the stipulated minimum price.

3. For the purpose of preventing evasion of the resale price restrictions imposed in respect of any commodity by any contract entered into pursuant to the provisions of this act (except to the extent authorized by the said contract):

(a) The offering or giving of any article of value in connection with the sale of such commodity; (b) The offering or making of any concession of any kind whatsoever (whether by the giving of coupons or otherwise) in connection with any such sale; or (c) The sale or offering for sale of such commodity in combination with any other commodity, shall be deemed a violation of such resale price restriction, for which the remedies prescribed by Section 6 of this act shall be available.

4. No minimum resale price shall be established for any commodity, under any contract entered into pursuant to the provisions of this act, by any person other than the owner of the trade-mark, brand or name used in connection with such commodity or by a distributor specifically authorized to establish said price by the owner of such trade-mark, brand or name.

5. No contract containing any of the provisions enumerated in Section 2 of this act shall be deemed to preclude the resale of any commodity covered thereby without reference to such contract in the following cases:

(a) In closing out the owner's stock for the bona fide purpose of discontinuing dealing in any such commodity and plain notice of the fact is given to the public; provided the owner of such stock shall give to the producer or distributor of such commodity prompt and reasonable notice in writing of his intention to close out said stock, and an opportunity to purchase such stock at the original invoice price;

(b) When the trade-mark, brand or name is removed or wholly obliterated from the commodity and is not used or directly or indirectly referred to in the advertisement or sale thereof;

(c) When the goods are altered, second-hand, damaged or deteriorated and plain notice of the fact is given to the public in the advertisement and sale thereof, such notice to be conspicuously displayed in all advertisements and to be affixed to the commodity;

(d) By any officer acting under an order of court.

6. Wilfully and knowingly advertising, offering for sale or selling any commodity at less than the price stipulated in any contract entered into pursuant to the provisions of this act, whether the person so advertising, offering for sale or selling is or is not a party to such contract, is unfair competition and is actionable at the suit of any person damaged thereby.

7. This act shall not apply to any contract or agreement between or among producers or distributors or between or among wholesalers or between or among retailers as to sale or resale price.

8. If any provision of this act, or the application thereof to any person or circumstance, is held invalid, the remainder of the act, and the application of such provisions to other persons or circumstances, shall not be affected thereby.

9. All acts or parts of acts inconsistent herewith are hereby repealed to the extent of such inconsistency.

10. This act may be known and cited as the "fair trade act".

Text Of Tydings-Miller Law On Resale Prices

Section 1 of the Act entitled "An Act to protect trade and commerce against unlawful restraints and monopolies," approved July 2, 1890, is amended to read as follows:

"SECTION 1. Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is hereby declared to be illegal: *Provided*, That nothing herein shall render illegal, contracts or agreements prescribing minimum prices for the resale of a commodity which bears, or the label or container of which bears, the trade mark, brand, or name of the producer or distributor of such commodity and which is in free and open competition with commodities of the same general class produced or distributed by others, when contracts or agreements of that description are lawful as applied to intrastate transactions, under any statute, law, or public policy now or hereafter in effect in any State,

Territory, or the District of Columbia in which such resale is to be made, or to which the commodity is to be transported for such resale, and the making of such contracts or agreements shall not be an unfair method of competition under section 5, as amended and supplemented, of the Act entitled 'An Act to create a Federal Trade Commission, to define its powers and duties, and for other purposes,' approved September 26, 1914: *Provided further*, That the preceding proviso shall not make lawful any contract or agreement, providing for the establishment or maintenance of minimum resale prices on any commodity herein involved, between manufacturers, or between producers, or between wholesalers, or between brokers, or between factors, or between retailers, or between persons, firms, or corporations in competition with each other. Every person who shall make any contract or engage in any combination or conspiracy hereby declared to be illegal shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding $5000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court."

Approved, August 17, 1937.

Schuh Says New Federal Law Protects Dealer's Profit Items

MILWAUKEE, Wis., Aug. 24. —Hailing the signing of the Tydings-Miller Fair Trade Law by President Roosevelt as a victory for organized retailers, Wilmer R. Schuh, president of the National Assn. of Petroleum Retailers, said that he believed the law would aid in bringing about improved marketing conditions on profit items sold at service stations, but did not believe it could be applied to the sale of motor fuel.

The bill was passed by Congress as a rider to the District of Columbia tax bill, after support of it had been withdrawn by the President. The new law will be a complement to the similar laws that have been passed in 42 states.

"The N. A. P. R. and its member associations have backed the Tydings-Miller Law because it was believed necessary to permit the functioning of the state laws," Schuh explained. "So many suppliers are in interstate commerce that state laws were certain to be ineffective because such companies might find themselves in violation of Federal price-fixing laws if they took advantage of the state laws. Obviously companies that are intrastate could not take advantage of the state law when they were in competition with interstate companies and so the state laws were valueless.

Holds Price on Profit Items

"Naturally the law cannot be made to apply to gasoline because the retail price is now in the hands of the retailers. However it can be used to advantage on the sale of packaged and trade-marked goods such as oils, greases, tires and other service station merchandise which are so frequently sold by cut-price stores today. These are the items upon which the service station proprietor must rely for profitable operation. Obviously it will aid service station men if all are placed upon an equal price basis.

"All of these trade laws are more or less of an experiment and it is quite probable that they will need to be altered and improved. Nevertheless they are an advance in recognized business ethics that is badly needed if the individual retailers are to continue, and to aid their respective communities.

"Our hope lies in the fact that suppliers of the profit items will take advantage of the law. It is permissive rather than compulsory, but this permission should be used voluntarily to protect the value of the trademark and proprietory rights. The fact that state laws of this type have been upheld in the courts should eliminate any doubts about their application."

Computing Pump Sales Continue to Gain

N. P. N. News Bureau

WASHINGTON, Aug. 23. — Shipments of computing pumps continued to increase during June, both in numbers and in proportion to total pump shipments, according to Census Bureau figures.

Total pump shipments in June amounted to 18,814 units, of which 18,080 were power-operated, and 15,567 of these of the computing type.

In May, total pump shipments were 15,499 pumps, of which 14,363 were power-operated, and 12,599 computing type.

Pumps shipments last June (1936) by the same American manufacturers amounted to 9406 pumps. Of the total, 8,785 were power-operated, including 6485 computing pumps.

June shipments were valued at $3,516,489, f.o.b. factory, compared with a value of $2,852,689 for pumps shipped in May, and $1,785,604 in June 1936, the Bureau's figures show.

President Signs Tydings-Miller Bill, Sanctions Resale Price Contracts

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and the District of Columbia, which have fair trade laws.

Oil Companies

Except for some of the Pacific Coast oil companies, which have price control clauses in their contracts with resellers, there doesn't seem to be any great disposition now among oil companies to enter into resale price maintenance contracts—on gasoline at least—even with the Tydings-Miller law on the books, according to a survey by NATIONAL PETROLEUM NEWS.

This coincides with a similar check several months ago (See N. P. N. May 5, Pg. 10-)

In a statement to N. P. N., Wilmer R. Schuh, president of the National Ass'n. of Petroleum Retailers, hailed the new law as protection for the dealer's "profit items" such as tires, tubes, batteries, spark plugs, and other accessories. However, Schuh does not believe that the law can be applied to control gasoline prices.

Differing with Schuh are the Detroit dealers who view the Tydings-Miller law as a means of rescuing them from their chaotic marketing situation. They hope that the major companies will now use Michigan's fair trade law to set minimum prices on their branded products.

In some quarters, a doubt has been expressed that fair trade laws can be applied to gasoline because it is only rarely sold in a container bearing the brand name. Others think the pump globe satisfies the law. However, everyone admits that it can be invoked to safeguard prices on canned lubricating oils.

Conflict With Chain Taxes

Possible conflict between fair trade laws and chain-store taxes is foreseen in some states, such as Iowa. Some observers believe that an effort to set resale prices might be construed by taxing officials as "controlling" the retail outlets so as to make the supplying company liable to the chain tax.

California dealers are out in front in using fair trade laws and have already filed one suit against a dealer charging him with selling a branded gasoline at less than the designated price.

Resale price maintenance laws spread like a prairie fire through the state legislatures following the U. S. Supreme Court's decision upholding the California law (See N. P. N., Dec. 9, 1936). This decision held that dealers, not parties to a resale price maintenance contract, could be made responsible for maintenance of prices specified in another dealer's contract for the same brand.

Midwest Uninterested

N. P. N. News Bureau

CHICAGO, Aug. 23.—Resale price maintenance laws in midwestern states have meant little so far in the marketing of petroleum products.

A survey by NATIONAL PETROLEUM NEWS some months ago indicated suppliers were not invoking the laws to make retailers sell their branded products at prices established by the supplier; nor was there any marked interest in suppliers wanting to invoke such laws.

A further survey this week indicates that the attitude of suppliers has not been changed.

Suppliers indicate some benefits might result from using such laws to protect branded motor oils from being kicked around on price and becoming "trade pullers." But gasoline is another story, and suppliers seem quite content to sell on a tank-wagon reseller's price, and let the retailer establish and get his own retail price.

Suppliers have had much experience in maintaining a retail price, back in the days when major oil companies and jobbers operated company service stations. With memories of price disturbances of other years, and the current delicate retail price structure with its numerous price wars, suppliers seem loath to enter the fray of price cutting and secret discounting through telling the retailer what his price must be.

Iowa was one of the early states to enact price establishment legislation. That was in 1935 by the same legislature that enacted the famous drastic chain store tax law.

State chain store tax laws vary in describing a "chain store" and the relation between supplier or owner of the property and the retailer as to the store being a chain. And the question has been considered by suppliers whether the owner of a place of business also being the supplier might bring the business into the "chain" classification if the supplier also dictated the lessee's retail prices.

New Production In Illinois Oil Fields To Reach 25,000 Barrels Daily By 1938

By LAWRENCE E. SMITH

MATTOON, Ill., Aug. 23

This Illinois leasing and development campaign which has to date brought about four or five new pools — depending on whether the Clay City pool and the Noble pool 5½ miles apart are one or two—is a Mid-Continent "play."

Most of the company personnel came in from the Mid-Continent and direction of the activity in most cases is from company headquarters in Oklahoma and Texas. Drilling methods are those of the Mid-Continent. The rotary, hitherto unknown to Illinois and, except in a limited way in Michigan, unknown to territory east of the Mississippi River, is in complete control of the new Illinois development. Thus, drilling contractors came from rotary country as did the crews. The one touch that is lacking to make it all seem like an Oklahoma or Kansas development is a crew of conservation deputies, oil and gas inspectors and proration agents. Illinois has no conservation law, hence no regulatory commission affecting oil and gas.

The count of operations in the state here given is as of Aug. 12, but a later one, not available as this is written, would show several more wells. On the date given there were 136 operations, including locations made and inactive wells. Of the total, 34 were wildcats, fairly widely scattered through the Illinois basin in which the greater part of the activity is now concentrated. More than 30 wells were drilling or rigging up in the Clay City pool, Clay county, and the Noble pool, Richland county, which may or may not be an extension of Clay City. Majority opinion is that Noble is a separate pool, but the sand levels of the two are about the same and only more drilling in the 5½ miles intervening will tell.

Activity in leasing and in geological exploration continues. There are 16 seismograph parties at work and one magnetometer was in operation on a recent date. There was also one gravimeter projecting around to see what it could find out. Besides all this mechanical activity, geologists are quite busy correlating all sub-surface information that is available and the Illinois Geological Survey, for years outstanding among state surveys, is lending every possible aid to oil companies. The survey has much information and the work done by J. Marvin Weller and Alfred H. Bell, of the state survey, made available as "Report of Investigations No. 40," has been of great value.

Dates Back Two Years

The leasing activity in the basin area dates back nearly two years but the greater part of it was done within the past year. In all, about 6,000,000 acres have been taken, much of it in huge blocks and at cheap prices. In its early stages, little difficulty was had in signing the landowners at small bonuses and annual rentals. There was considerable of the "dollar a farm" bonus and 10 cents per acre rental. Much of the leasing was of the 30 cents bonus and 30 cents rental and gradually, as the fever mounted, prices went up. There is little to be had at 50 cents now and that isn't at all choice. Acreage presumed to be in the path of present development but several miles from production now commands as high as $25 per acre bonus and $1 rental. And a number of deals have been made at prices far higher than that.

To the industry the big question is the effect this will have on supply. Production at the moment from the deep part of the basin — from the two or three pools, whichever it turns out to be—is around 7,500 barrels daily from 17 wells but this is due to increase rapidly, as more than 30 wells are under way and little time is required to drill them. Average completion time is 21 to 23 days, which includes two cementing jobs. Depth of wells is 2900-3000 feet. Thus, they will be popping in in bunches from now on in the area under most intensive drilling, which is around the two "holes" in the quarter-million acre block of the Pure Oil Co. in Wayne, Richland and Clay counties.

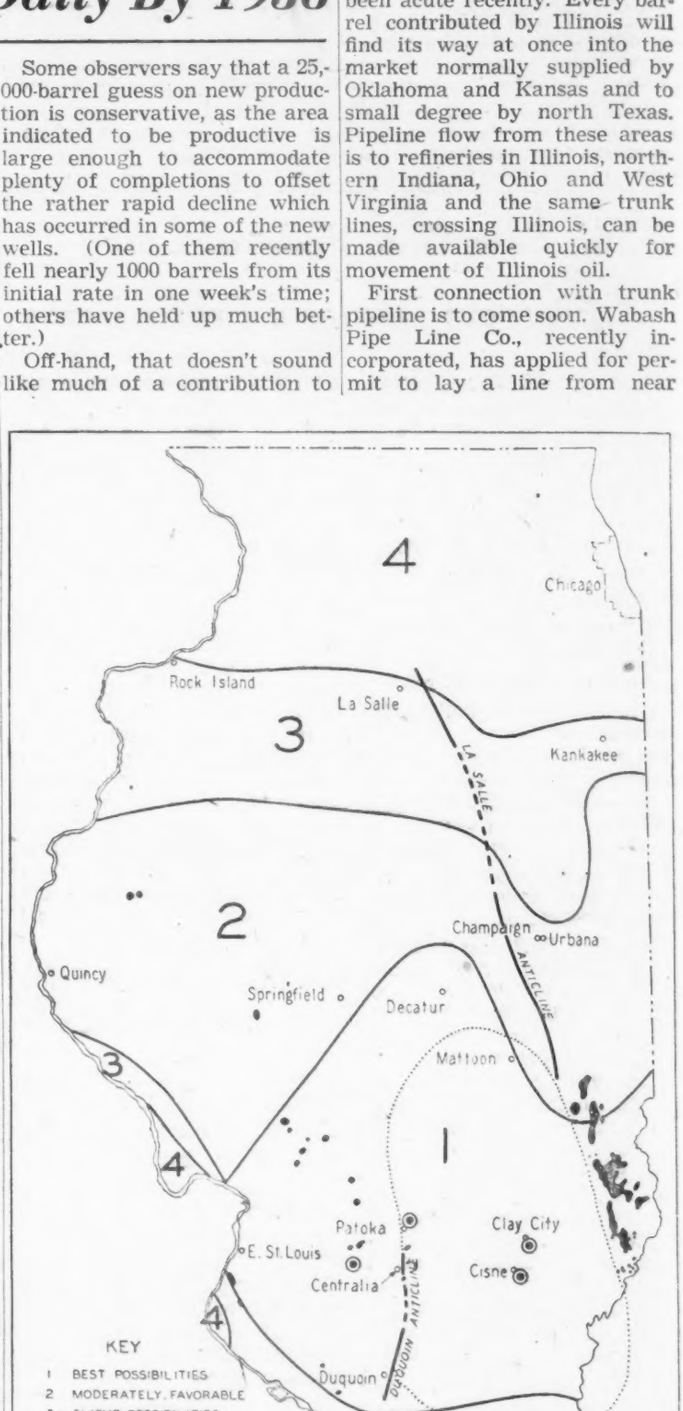
25,000 Barrels Daily Seen

It is altogether probable that production of 25,000 barrels daily will be reached before the year ends. That is to say, that much from the new fields, over and above the 12,178-barrels daily average of 1936, which came from old fields. The June report of the U. S. Bureau of Mines shows that the state produced an average of 15,400 barrels daily in that month, more than 3000 barrels daily up from the 1936 average.

Some observers say that a 25,000-barrel guess on new production is conservative, as the area indicated to be productive is large enough to accommodate plenty of completions to offset the rather rapid decline which has occurred in some of the new wells. (One of them recently fell nearly 1000 barrels from its initial rate in one week's time; others have held up much better.)

Off-hand, that doesn't sound like much of a contribution to the national supply, but its effect will be felt, especially in Oklahoma and Kansas whose troubles in holding production to the level of demand have been acute recently. Every barrel contributed by Illinois will find its way at once into the market normally supplied by Oklahoma and Kansas and to small degree by north Texas. Pipeline flow from these areas is to refineries in Illinois, northern Indiana, Ohio and West Virginia and the same trunk lines, crossing Illinois, can be made available quickly for movement of Illinois oil.

First connection with trunk pipeline is to come soon. Wabash Pipe Line Co., recently incorporated, has applied for permit to lay a line from near



The Illinois Geological Survey recently gave its ideas as to the relative possibilities of oil and gas in the state. Prominently shown are the Cisne and Clay City pools, 1937 discoveries. Cisne is small and temporarily inactive; Clay City is the area of present intensive development. Not shown is the Noble pool, 5½ miles east and a little north of Clay City. Noble is a discovery of recent date; it is considered by some as a separate pool but may be an extension of Clay City.

Noble to Martinsville, about 45 miles northeast. Martinsville is a receiving point on the Illinois Pipe Line Co.'s main trunk which runs northeast from Wood River, Ill., refining district near St. Louis. The Wabash company is a Pure Oil Co. subsidiary. At present the Illinois Pipe Line Co. is the only gathering-trunk system in the state. Pending the completion of enough wells to indicate size of line required, oil from wells in the new pools of the basin area has been handled by short lines to loading racks.

Rates Favor Illinois

The reason for immediate utilization of the Illinois oil in preference to Mid-Continent is the same reason that gave Texas the advantage over the Mid-Continent. That is lower transportation rates. Trunk line rates from Illinois points are now materially lower than those prevailing from Oklahoma, Kansas and north Texas. Here are some comparisons, as shown in the tariffs of Oklahoma Pipe Line Co., Sinclair Refining Co. and Texas-Empire Pipe Line Co. from Oklahoma, Kansas and north Texas points, and the rates of the Illinois Pipe Line Co. from Bridgeport, Martinsville and Stoy, Ill., trunk line receiving points in the old fields of eastern Illinois:

To International Boundary, delivery point for crude moved to the Sarnia, Ont., refinery of Imperial Oil, Ltd., the Mid-Continent rate is 55 cents and from eastern Illinois it is 31.5 cents.

From Mid-Continent to Latonia, Ky., where Standard Oil Co. of Ohio has refinery, the rate is 51 cents; from eastern Illinois it is 23 cents.

From Mid-Continent to Lima, O., another refining point of Standard of Ohio, rate is 51 cents; from eastern Illinois, 22 cents.

From Mid-Continent to Findlay, O., refining point of National Refining Co., 52 cents; from eastern Illinois, 26¼ cents.

From Mid-Continent to Earhart, Mich., near Detroit, 55 cents; from eastern Illinois, 30.5 cents.

From Mid-Continent to Cleveland, O., 55 cents; nearest point quoted from Eastern Illinois is East Sparta, O., 31.5 cents. This point is beyond Cleveland.

Rates from Mid-Continent to Heath, O., refinery point for Pure Oil Co., 55.5 cents; Cabin Creek, W. Va., Pure Oil refining point, 57 cents; Bayshore, O. (Toledo), refining points for Standard of Ohio, Gulf Oil Corp., Sun Oil Co. and Pure Oil Co., 52¼ cents; nearest point to Toledo quoted from eastern Illinois, Cygnet, O., 26.4 cents.

Rate from Mid-Continent via Texas-Empire Pipe Line Co. system to Lawrenceville, Ill., is 40 cents. This is about 40 miles from the new development.

Rates from eastern Illinois given are those now in effect and do not cover the new fields on which no tariffs have been filed. When new rates are published covering movement of oil from the basin area they probably will be close to those which Illinois Pipe Line Co. charges for the movement of oil from the older areas of development as distances will be nearly the same. The quotations given indicate that Illinois' new crop of crude may be moved to refineries of Indiana, Illinois and Ohio at 20 and 25 cents per barrel less than those refineries now pay for Mid-Continent oil, as to trunk line rates. Present gathering charges in the old fields of Illinois is 20 cents, compared to 10 cents in the Mid-Continent generally and 5 cents in the Oklahoma City field.

Crude Compares Favorably

The new fields of the Illinois basin yield a crude that varies from 39 to 41° A.P.I. gravity and compares favorably in yields and quality with the best of Mid-Continent oils. It carries a trace of sulfur but not enough to present a refining problem. The formation from which it comes, the McClosky "sand," Ste. Genevieve section of the lower Mississippian is new only in the sense that it has been found productive in the basin area. It is one of the several pay horizons in the old fields of eastern Illinois where it has a productive area of 6950 acres, according to reports of the Illinois Geological Survey.

Pay formation in the basin is not a sand but is an oolitic lime. That formidable term means simply a lime made up of small rounded grains or concretions, cemented. Such a formation may be likened to the shad roe which the restaurant serves on toast and garnished with bacon, only the oolites are much smaller, as though they had been laid by a minnow. Carbonate of lime is the chief ingredient. The McClosky "sand" is such a formation and its best section of saturation is 10 to 12 feet, as in the old field to the east. Porosity, as well as structure, will play large part in recovery of oil in the new field. This has been demonstrated already. Some of the wells flow naturally, others are pumpers from the beginning. There is little gas.

Development Is Simple

No outstanding development problems are in sight. Wells are completed in 21 to 23 days, including the time required to run and cement 200 to 300 feet of 10¾-inch O.D. and string of 7-inch O.D. at top of the pay. The first 50 to 60 feet from surface consist of loose drift and from there on sandstones and limes predominate. These are pretty hard and rock bits are used all the way after the hard formations are encountered. Diesel and semi-diesel engines are used for power in most cases, for good boiler water is not plentiful. Completion costs chargeable to each well under lease development conditions should finally be $18,000 to $20,000.

Pure Oil Co., holder of most of the acreage in the deep part of the basin, is using 94-foot derricks with re-legs. When the well is completed the re-legs are moved and the derrick left for pumping operations. The wells now pumping are operating with individual units but it is probable that later, with more wells to pump, central band wheel powers will be installed.

Shut-down Threat Is Made In Mexican Labor Tangle

By T. W. WATSON
N. P. N. News Bureau

NEW YORK, Aug. 21. — The possibility that foreign oil companies operating in Mexico would withdraw their capital and discontinue operations there was threatened this week after a report of the Mexican investigating commission recommended an $8,000,000 pay increase and other concessions from the oil firms.

Oil executives from the foreign affiliates of the Standard Oil Co. of New Jersey, Royal Dutch-Shell, Consolidated Oil Corp., Standard Oil Co. of California and the Gulf Oil Corp. met in New York this week to discuss the situation brought about by the commission's report. No statement was made following the meetings, but it was understood that the oil companies told the Mexican government that their future operations in Mexico will be economically impossible if the commission's findings are forced on them. The matter now is before President Cardenas.

Recommendations

The government's commission recommended that the workers receive pay increases amounting to about $8,000,000 annually; that the workers be put on a 40-hour week with pay for 56 hours; that free life insurance and pensions up to 85 per cent of the retiring wages should be granted; that vacations with pay should be granted up to 30 days a year and that 80 per cent of the wages should be paid during non-vocational illness up to four months. The commission also recommended that workers should receive full pay while on strike, without any time limit.

A proposal made last June by the oil companies to increase payrolls by $4,500,000 annually and to apply the 40-hour week with 56 hour pay, was rejected in the commission's report, on the grounds that these companies and other operators were able to pay twice that amount even though their average profits for a ten-year period (1926-1937) were shown to be, collectively, no more than 4.25 per cent. The commission's report acknowledges that the foreign oil companies have increased wages 61.95 per cent since 1934.

Would Double Costs

The oil companies made vigorous objections to what they construed as the obvious errors in the commission's calculations, the biased nature of the report and to its failure to take into consideration the cost of additional pensions and retroactivity of many other clauses of the workmen's petition, all of which would increase operating costs nearly 100 per cent, or around $15,500,000, it was estimated.

Insecurity of tenure, delay in securing permits to drill for oil, increased taxation, extravagant labor demands and downward revision of prices of petroleum products by government decree were held by oil companies to be the major factors in an unfavorable outlook for future operations in Mexico.

The oil companies have pointed out to the government the progressive increase in wages of workers, the additional social benefits such as savings funds, schooling for workers' children, vacations and holidays with full pay, free medical service to all families of workmen and indemnifications for vocational risks as part of the things they have done beyond the provisions of the Mexican laws to contribute to the welfare of the country.

Apart from the investment of capital in Mexico, the oil industry paid nearly $250,000,000 in taxes up to 1936, the companies stated. Nearly $8,500,000 in gasoline taxes was paid to the Mexican government last year for new highway building and nearly $14,000,000 will be collected in motor fuel taxes this year.

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From the Pen of **Ellick Botts**

Finds Conditioned Air is But Ill Wind Scrambling an Integrated Company

To the Editor:

I was noticing in your paper this week that somebody had paid out some prizes for suggestions about how to run filling stations as to the kind of service, etc. that should be offered without waiting for the customer to demand it and that most of the clients wanted their windshields cleaned. However, what struck my fancy was some of the other ideas, like minding the baby and taking the dog for a walk. I have placed a copy of this article in the hands of Milt Erp, our local filling station monopolist, with view to improving his work. He has always shown a willing disposition, especially in such matters as playing checkers with his customers and straightening them out on their political ideas, but he is a little shy on such things as windshield service and changing tires and babies.

What I really started out to write you about, however, is the confusion that has come up in the oil business out here because of this air-conditioning. The matter was called to my attention a few days ago by a man who is employed by a company in Tulsa.

This citizen says that the confusion that has come about among the numerous departments of his integrated company since they began sending cold air about over the place, has been indescribable. It seems that the conditioned air gets mixed up quite a lot and frequently goes from one department to another, with disastrous results, my friend said. He claims that the thinking in each division is influenced no little by the kind of air they breathe and the mere fact that some atmosphere came off the producing department and settled on the refining personnel has already been demonstrated to be productive of chaos.

His attention was first called to the fact, he says, a few days ago when he noticed that several file clerks, ordinarily peace-loving and amiable to one and all, began bristling up when anyone approached and emitting refusals to do this and that even before being asked. Subsequent investigation disclosed that refrigerated air was coming into the file room from the pipeline department and the mystery was cleared up as pipeliners always have their dukes up and dare the entire world to make them do anything they don't want to do.

Given this much of a lead, my friend started looking around the other departments of his company and was able to run down some very queer things. The accounting department had been treated to some air from the core analysis room and the profit and loss statement came out expressed in millidarcys and porosity. The geologists were mixed up with the geophysicists even more than usual and several choice anticlines had left their moorings. The land department, usually full of gloom and foreboding toward any broker with leases to sell, were giving out optimistic utterances to a bewildered leasehound, giving him a good sales talk on the future of the industry and of the state, with plentiful remarks on Democratic prosperity and in general sounding like Col. Ernest O. Thompson. My friend discovered that the same air conduit that served the proration department continued on to the land and lease boys.

And so it went, throughout the building. Perhaps the worst mix-up was in marketing. They were affected by the paleontologists and brachiopods were being substituted for octanes in the quotations.

I am telling you this as it came to me. Personally, I have had no experience with air conditioning, taking the good with the bad the year around and what all happens when man attempts to improve on nature I am sure I do not know. But this is worth a thought and if my friend's version be true, then it is time to do something before the legal department gets mixed up in all the operating divisions.

Yours truly,
Ellick Botts,
Consulting Pumper.

Lube Oil From Sharks

N. P. N. News Bureau

WASHINGTON, Aug. 23.—A recently invented Japanese process enables use of shark oils as lubricants in aeroplane and other motors at temperatures as low as 45 degrees below zero, according to a report received by the Commerce Department from its Tokyo office.

Further use is made of shark oils in that country in tempering steel and in the tanning industry, while low grade oils, after being hydrated, are used to manufacture hardened oils, the report says.

Shark catches have been made by Japanese fishermen in the South Sea Island since 1935, but the oil is said to be inferior to that taken from sharks frequenting northern waters, according to the report.

Crown Central Marketing Area Growth is Seen

BALTIMORE, Md., Aug. 23.—Expansion of the marketing territory of Crown Central Petroleum Corp.—now confined to New England and the New York metropolitan area—is believed to be forecast by the company's obtaining a Maryland charter last week.

Officials of the corporation, originally chartered in Delaware, explained the Maryland incorporation by saying that executive and general offices of the company have been located in Baltimore for some time, and that efficiency will be better served by having the corporation chartered in this state.

While officials of the company would not say what states their expansion program might take them into, they were emphatic in declaring that the marketing policy of the Maryland corporation will be a continuation of that of the Delaware corporation—selling petroleum products directly to independent jobbers, but operating no retail outlets.

Refinery capacity of Crown Central's Houston refinery recently has been substantially increased, and the company has constructed a new pipeline from its production fields in Texas to Houston. Crown Central produces about 30 per cent of its own crude requirements.

The only retail outlets maintained by Crown Central are a few sites around Houston which it uses as a "barometer" of consumer appreciation in connection with new blends and types of motor fuel, according to its officials.

In changing over the stock structure from the Delaware corporation to the Maryland corporation, stockholders in the old corporation will receive one share of $5 per common stock in the new corporation for each five shares of $1 par stock now held.

Henry A. Rosenberg, son-in-law of the late Louis Blaustein, founder of American Oil Co., is president of Crown Central.

Rowley With Tulsa Tribune

TULSA—Andrew M. Rowley, well known oil writer and editor, has become oil editor of the Tulsa Tribune. The editorship of the magazine devoted to oil royalties, founded this year by Mr. Rowley, has been assumed by Campbell Osborn, Tulsa attorney and petroleum economist.

Dealers Favor Half Day Off, Rules on Hours

N. P. N. News Bureau

CLEVELAND, Aug. 23.—Preliminary tabulations today of 500 answers to a questionnaire distributed among its membership by the Cleveland Assn. of Petroleum Retailers revealed that 90 per cent favor regulation of opening and closing hours of service stations and a one-half day closing.

More than 90 per cent checked "yes" to the question, "Are you in favor of regulating opening and closing hours at filling stations?," according to Gust. C. Linsenmann, vice president, and C. V. Anderson, field secretary. While a few favored closing one day per week, in response to question two, the majority favored a one-half day closing.

The majority favoring the closing stipulated Wednesdays at 1 p. m. for the balance of the day as its preference. Some, however, indicated a preference for closing stations at 2 p. m. Sundays.

"Greatest complaint of the independents is long hours at the stations," Linsenmann said. "Yet to get hours cut we would have to secure co-operation of all tracksides and company-operated stations, as it would be suicide to close with them open. We sent questionnaire blanks to majors but have received as yet no replies from them."

Dr. W. P. Edmunds, industrial relations manager of Standard of Ohio, said he personally favored a half holiday for the dealers.

Best Days

The dealers replying to the question, "Which day of the week is your best?," listed Saturday in about 50 per cent of the cases, while an equal number wrote in "Friday and Saturday."

No exact information was forthcoming on the best hours of the day for business, although Anderson said most neighborhood stations secured little business after 8:30 p. m. Monday was usually listed as the poorest day.

Answer to question five revealed that nearly all stations were opening between 6 and 7 a.m. while closing hours ranged from 9 to 11 p. m., with a few open until midnight or 24 hours a day.

It is only the younger fellows that want to stay open all the time, Anderson commented. The rest know the hardships of long hours at the station. Yet each is open because of the fellow down the street, he said. Most dealers answering were proprietors of neighborhood stations, as distinct from stations catering to transient or commercial business.

Question ten asked "Does your lease fix hours, if so what hours." All answers so far indicated no such clauses were in the leases, although a few are known in the city. The dealers signed their names and station locations to the questionnaire.

Buchanan Returns

TULSA, Aug. 24.—D. E. Buchanan, president of Hanlon-Buchanan, Inc., natural gasoline manufacturer and marketer, has returned from a trip of nearly three months to Europe. He left here late in May for the International Petroleum Congress in Paris to which he was by appointment of the State Department chairman of the American delegation to the congress. With E. I. Hanlon, board chairman of Hanlon-Buchanan, he then visited several European capitals and principal cities. In Italy Messrs. Hanlon and Buchanan had audience with Premier Mussolini.

Change In Profits Tax Pressed While Revenue Act In Drydock

N. P. N. News Bureau

WASHINGTON, Aug. 23.—Senator Frederick Van Nuys, Indiana, who told Independent oil jobbers of his state that he would sponsor a bill to amend the federal undistributed profits tax, did not introduce the measure because, he said, it was "impractical" to get it through Congress at the session just ended.

However, the Indiana senator told National Petroleum News he plans to introduce his profits tax amendmends at the next session, probably in connection with the Treasury Department's new tax program.

An entirely revised system of federal taxation, employing methods never before used by the national government in raising revenue, is to be submitted to Congress by November (when it is expected a special session will be called), according to plans now being carried forward in the Treasury Department.

The new tax program probably will be transmitted to Congress at that time in a special message by President Roosevelt. This would allow House and Senate committees time to whip it into shape for action when the regular session of Congress opens in January.

In view of the widespread criticism of the undistributed profits tax by businessmen—big and little—the President may feel called upon to make a strong defense of the measure. It will be recalled that this surtax on undistributed corporate earnings was enacted in 1936 at the "command" of the White House as a means of forcing corporations to pay out all their earnings as dividends. It was contended that big corporations were piling up surpluses and thus retarding recovery.

In practice, however, the profits tax has burdened smaller and moderate-sized companies, preventing them from using their earnings to pay off debts, modernize their plants or build up reserves for future business contingencies.

It is not unlikely, according to observers here, that the President's message, while defending the profits tax, will admit that it is "not perfect" and suggest some modifications — limited though they may be. That the President will recommend outright repeal of the much-criticized tax, is considered highly improbable in view of the Treasury and White House both believed that the tax is sound in principle.

The question of the profits tax is being thoroughly studied by Treasury Department, it is understood, with attention being given to the protests of small businessmen as well as the comprehensive objections from such organizations as the Chamber of Commerce of the U. S.

Factors To Be Considered

Important factors which will have a direct bearing on the Administration's ultimate attitude toward revision or repeal of the profits tax in the opinion of observers here, include the following:

1. Effectiveness of protests submitted by businessmen—protests setting forth specific instances of inequitable operation of the tax law carry greater weight with the Treasury than general criticism.

2. Conclusion reached by the Treasury as to the need for a change in this tax.

3. President Roosevelt's wishes and views when the final draft of the Treasury's report on the new tax program is submitted to the White House.

4. How the principle of a surtax on undistributed profits ties in with the broad underlying objectives of the new federal tax program.

Program Being Drafted

Broad outlines of the nation's new taxation picture are now being sketched in by Undersecretary of the Treasury Roswell Magill, who is working with the congressional joint taxation committee.

The country's tax system of the future, according to Treasury officials speaking informally, is to be based on the theory that the revenue-raising machinery should be adaptable to changing economic conditions.

Higher levies would prevail through the federal tax structure during prosperous years, when individuals and corporations are in the best position to pay. When periods of depression set in and the national income shrinks, harassed taxpayers would be given the benefit of reduced rates, according to this plan.

As seen by Treasury experts, the new tax system would provide an ever-normal treasury, piling up surpluses in times of plenty for expenditure in the lean years, and tending to curb unsound speculative booms and cushion the shock accompanying depressions.

To some businessmen this argument may have a familiar ring—they should be pardoned if they mistake it for an echo of their own argument against the profits tax which "penalizes" their efforts to lay aside something for a rainy day.

Trucking Problems On Expo Program

HOUSTON, Aug. 23.—A two-day transportation meeting of the oil and gas industry has been scheduled for Oct. 13 and 14 during the Oil-World Exposition, Inc., to be held here Oct. 11 to 16. Fleet operating problems will be discussed mainly.

Those serving on the transportation committee are: T. G. Price, Shell Petroleum Corp., Houston, chairman; Leo New, United Gas System, Houston, vice-chairman; and Oscar Lynch, Humble Oil & Refining Co., E. B. Tilley, Hulf Oil Corp. and Jack Parker, Transportation Equipment Co., arrangement committee.

Other committee men appointed were: Tom Bradfield, The Texas Co.; Roy Fike, Mid-Continent Petroleum Corp.; J. E. Johnson, Tide Water Oil Co.; Alex Muncie, The Pure Oil Co.; Lonnie Smith, Sun Oil Co.; Dan Moran, Continental Oil Co.; S. C. Bovell, Magnolia Petroleum Co., and Sam Phillips, Sinclair-Prairie Oil Co.

Mid-Continent Skyline

By LAWRENCE E. SMITH, N. P. N. Tulsa News Bureau

TULSA, August 21

The move of the Senate of the United States to assert federal ownership of tidelands all around the continent and out to the three-mile limit is certain to provoke the people of Texas. Doubtless other states will be ired, too, but the Texans are in somewhat different position than the others. They interpret that Congressional resolution of 1845 which amounted to a treaty of annexation — that was the federal act which created the state of Texas from what had been a republic — as reserving to the state all the unappropriated lands. The language, in fact, is quite specific and the state has exercised full supervision over tidelands as well as the beds of navigable waterways.

Thus, the state supervises the fishing and oyster culture in the tidelands and has leased for oil development considerable of this offshore real estate. It is right now getting ready to lease some more north and south of Corpus Christi.

The federal bill isn't law yet, as the House did not act. It likely will come up in the next session. The thing has the makings of a first rate brannigan, for Texas leaps to action whenever its property and its privileges are threatened.

No Proration Authority in Illinois

Several have inquired whether Illinois has a statute that will enable the state to control production in line with the general idea over the country of balancing supply and demand.

The state has no law on this subject. Oil and gas conservation, in fact, have been dealt with but sketchily by the legislature. About all that is on the books is a plugging statute, designed to protect oil sands and fresh water sands from extraneous waters, but this is administered by the county coal mine inspector and the county that has no coal and no inspector has no plugging regulation. Oil operators are required to protect coal seams of five feet or more. There is no requirement of state permit to drill a well, as is the case in many states.

Thus there is little regulation of oil in Illinois and that makes the state attractive to many, especially as there is no production tax. Illinois belongs to the Interstate Oil Compact and under the charter of that league is pledged to work for the enactment of oil and gas conservation laws. Doubtless some attempt will be made next session to get a full set of modern, streamlined statutes with emergency clauses but, special sessions excepted, that's nearly two years away.

Purely Personal Note

We have been trying hard for the past month to get one of our favorite colonels to put on the full regalia of his office and let us take his picture. He is Ralph O. Dietler, vice-president of Stanolind Crude Oil Purchasing Co., and he was recently appointed colonel on the staff of the governor of Oklahoma. Our efforts have been fruitless. Col. Dietler is modest about it all and, we think, unreasonably so, for he looks the part far more than many a much-photographed colonel.

The writer felt pretty good about this appointment. He had been worrying some about Indians this summer. Some of them are quite mad about income taxes and there was no telling when they might storm the blockhouses of our pioneer community. But with Col. Dietler in charge, we thing the defenses of the first congressional district are in good shape.

No Phenagling in Lease Storage

Periodically, rumors circulate that much "hot" oil is being run in the Corpus Christi district. Most recent had to do with storage of water in lease tankage. By this method, some operators were supposed to be reporting as oil on leases a considerable amount of water, then draining off the water and replacing with excessively pro-

Survey of the Corpus Christi field has been made by Railroad Commission agents and report made. All tanks contained as much as 200 barrels of fluid were gauged and the amount of water ascertained. Of 229 tanks on 105 leases only two had basic sediment and water above pipeline outlet. Conclusion of the investigators was that no falsifying of reports in the manner rumored was going on.

Similar surveys of other fields in the area are to be made.

Last Gap is Closed

It is an item of importance that the final bit of paving on U. S. Highway 66 in northeastern Oklahoma has been completed and will be open to traffic Sept. 1. For the past 10 years there has been a detour somewhere in that section on 66 most of the time. It is all paved now across Oklahoma and all the way to Amarillo except for a few miles in Texas and by taking the southern route through El Paso it is possible to go from New York to Los Angeles on hard surfaced roads.

"Please, Col. Thompson"

(*Continued from page* 17)

erator made a bit of history by asking the commission to reduce the allowable production in two fields where he is interested. He said that efficiency would be served in these fields by producing at slower rate.

The current crude market is generally called shaky. Oil allowables in western Kansas have been exceeding the pipeline capacity in some pools and some pipelines are doing a little prorating of their own. Some sales are reported in the trade in Oklahoma with gathering charges waived, which amounts to a price cut. Purchasers are in agreement that there is plenty of oil and one is reported to be willing to relinquish connections to wells, which is quite a drastic step. In times of over-supply it is customary to "farm out" stated quantities of crude, but purchasers dislike the giving up of connections to producing properties. The day usually comes when they wish they had them on the line.

All this sounds pretty gloomy but purchasers, who are about as good at sizing up conditions as are any others, say the simple remedy of reducing allowables will be effective. To what extent Texas is applying the remedy will probably be shown elsewhere in this issue, for the Railroad Commission was expected to issue its September order about Aug. 23 or 24.

The trouble, currently, is not that Bureau of Mines figures are too high but that too little attention has been paid to them. "If we could wipe the slate clean, dispose of all accumulations of under-run allowables and trim production to the Bureau of Mines recommendation, everything would be in good shape," was the comment of one purchaser.

The extent to which the Bureau's estimates have been exceeded the first half of this year was shown this week by figures compiled by the oil and gas conservation department of the Oklahoma Corporation Commission. Only the Bureau recommendations and actual production as reported by the Bureau were considered and overages are based only on the Bureau forecast. This does not imply excess production over state allowables in the case of Texas, Louisiana and New Mexico, for those states have been setting their own market demand figure for a long while. Thus, Texas has exceeded Bureau of Mines estimates by more than 100,000 barrels daily for the first six months of this year but its allowables have been consistently higher than the Bureau recommendation and its own figures month after month show an underproduction of two per cent or more. Oklahoma and Kansas have generally set allowables that match the Bureau figures to the barrel and the overages in those states is production above allowable in a sense that does not apply to the three other states. California, with no proration laws, gets along the best it can under voluntary planning, effective only part of the time.

The record for the first half of 1937 is as follows, daily averages:

State	B. of M. Recommendation	Actual Production (B. of M.)	Daily average
California	575,533	618,117	42,584
Kansas	179,067	192,750	13,683
Louisiana	237,933	243,467	5,534
N. Mexico	90,467	103,583	13,116
Oklahoma	600,550	642,950	42,400
Texas	1,271,450	1,373,283	101,833
All other states	239,650	250,833	11,183
Totals	3,194,650	3,424,983	230,333

Daily average excess over Bureau recommendations for all 1936 in the U. S. was 186,633 barrels.

Oil Expo Bills Signed

By Teletype

WASHINGTON, Aug. 24. — President Roosevelt late today signed bills authorizing him to invite foreign countries to Oil World Exposition at Houston, Texas, Oct. 11-16, and the International Petroleum Exposition at Tulsa, May 14-21, next year.

Etex Allowable Left Unchanged

By Teletype
N. P. N. News Bureau

TULSA, Aug. 23. —Contrary to general expectation the East Texas field was not reduced in allowable for September in the order announced by the Railroad Commission, but the state as a whole was cut to 1,144,734 barrels daily, effective Sept. 1. It was thought that the East Texas allowable might be cut in view of testimony at the commission's Austin hearing last week that the decline in bottom hole pressure in that giant field had increased sharply.

This is a reduction of 110,000 barrels from the allowable on Aug. 18, but is 28,134 barrels higher than the daily average recommended by the U. S. Bureau of Mines. Compared to the allowable on Aug. 1, the new figure is 53,757 barrels less. Day to day increases in allowable as wells are completed ran the total up rapidly and will continue to do so the rest of August. Actual reduction will, therefore, be much greater than indicated on the basis of Aug. 18 allowables.

Areas of current widespread drilling campaigns before the heavy part of the cuts. West Texas will begin September with 28,941 barrels less allowable than on Aug. 18, while southwest Texas down 27,361 barrels, Gulf Coastal down 27,277 barrels and East Central, including Rodessa, down 19,084 barrels.

With this example before them, Oklahoma and Kansas regulatory bodies meet this week to plan their September orders. There is considerable sentiment in the trade for reduction below amounts recommended by the Bureau of Mines.

Retailers Puzzle Over Trade Laws

LOS ANGELES, Aug. 21.—Provisions of California's Oil Substitution act, amended at the 1937 legislative session to provide more control against misrepresentation in the marketing of petroleum products, were outlined to distributors, service station operators, and salesmen and representatives of leading suppliers at a meeting sponsored by the Retail Petroleum Dealers Assn. here.

Scheduled to become effective Friday, Aug. 27, this bill curtails price and product advertising practices which mislead the motoring public, requires posting of actual resale prices, and specifies that resellers must have written authorization from the manufacturer to rebrand products.

There was considerable discussion at the R.P.D.A. meeting on whether a distributor, who had authority to rebrand, could pass this privilege on to his resale accounts. That is, has the distributor the authority to sell gasoline to a service station operator and let him resell it under another brand or under a "no brand" classification, or must the station operator have a letter from the refiner direct.

Opinion Is Yes

In the opinion of a representative of the state department of weights and measures, the distributor, provided he had a rebrand letter from the refiner, could give his dealer accounts the right to rebrand.

However, it was decided to propound the following to the attorney general's office in Sacramento: "Is the distributor given the right to give a rebranding privilege to the service station in the same manner as the refiner gives a letter of rebrand to the distributor?"

Another question raised at the meeting was whether a service station must sell gasoline at the actual posted price, or whether it could sell this product at more than the posted price, granted that selling below the price was prohibited.

J. Hart Dasteel, counsel for the R.P.D.A., discussed the Robinson Patman law, the Unfair Practices Act, the Fair Trade Act and the Oil Substitution measure. He pointed to these enactments as laws against discriminatory practices, secret rebates, selling below cost, and having other features scheduled to help stabilize retail markets.

He said the laws were originated for the purpose of protecting the public from fraud and to stop cut-throat competition, which has existed in certain petroleum markets, and to allow dealers and distributors a fair living.

A speaker from the floor asked if green trading stamps would be construed as a violation of the Unfair Practices Act, which prohibits discounts.

It was pointed out that anything which is given away (free lubrication jobs, green trading stamps, dishes, tickets on an automobile etc.) are against the law.

Wide Variety Of Oil Exhibits Listed For N. O. M. A. Show

N. P. N. News Bureau

WASHINGTON, August 23.—Reservations of space for the 1937 trade exhibit being conducted in connection with the National Oil Marketers Association in convention in Chicago's Stevens Hotel October 12-14 indicate an exhibition of equipment larger than at either of the two previous conventions, according to N.O.M.A. Secretary Paul E. Hadlick.

This forecast is based on advance reservations only, Hadlick said, and a number of other exhibitors are certain to take space before the opening of the convention.

One of the larger exhibits will be that of Chevrolet Motor Co., Detroit, which has reserved eight spaces for a display of motor trucks designed especially for oil jobbers.

As at previous N. O. M. A. conventions, NATIONAL PETROLEUM NEWS and Platt's Oilgram have reserved two spaces where the newsgathering facilities of the two trade publications will be demonstrated to convention visitors by members of the staffs, and where oil industry literature will be available.

Other concerns supplying the needs of the independent oil jobber who have reserved space already include, according to Hadlick:

American Can Co., S. F. Bowser & Co., Inc., The Canfield Oil Co., The Chek-Chart Corp., Crown Can Co. (Div. of Crown Cork & Seal Co.), Erie Meter Systems, Inc., Irving-Cloud Publishing Co. (Super Service Station), Lubrication and Maintenance, Morrison Bros., Petroleum Age, Petroleum Exchange Corp., Pittsburgh Equitable Meter Co., Quaker State Oil Refining Corp., and Sinclair Refining Co.

Numerous other equipment firms are in correspondence with the Washington office of the association, Hadlick says, and are expected to make early selections of space.

"The various displays," according to the secretary, "will make an attractive and educational exhibit of equipment and supplies used by the Independent oil jobber."

Speakers of national prominence are being engaged for the convention sessions by Hadlick. The meetings will be presided over by M. B. Whiting, Clifton Forge, Va., president of N.O.M.A., and, in addition to the address, will afford adequate time for discussion of problems by the jobbers themselves.

Says 'Dummies, Cutting Prices

(*Continued from page* 17)

at the meeting when a resolution was passed favoring the making of a cost survey among the association members. Forms were passed out which requested such information as total gallonage, total expenses, total gasoline sales in dollars, so that the cost of gasoline to the dealer and his cost of doing business can be established.

The fair trade law provides that such a cost survey shall be competent evidence in proving the cost to such persons. Data of the survey will be introduced in court as evidence that dealers who sell below the cost established by the survey are in violation of the fair trade law. A certified public accountant has been employed by the association to tabulate results of the survey.

Station Banners

As a step to educate the public in their fair trade operations association members this week are hanging banners in front of their stations carrying the message "no substitution—no dilution—no short measure—no price cutting."

It was reported at the meeting that at least one accessory supplier was cooperating. The suppliers district manager announced he had written his home office recommending that a large Detroit gasoline and accessory retailer who offers discounts be dropped as an outlet for the company's product. This speech was enthusiastically acclaimed by the dealers and brought him many promises of new outlets from independent dealers.

Substitution and dilution of gasoline are expected by some reliable observers to be the next problem if discounting practice continues and, according to Peck the prosecuting attorney already has evidence that substitution is being practiced.

Petroleum Trucking

N. P. N. News Bureau

WASHINGTON, Aug. 23.—Truck loadings of all commodities in July showed a drop of 6.42 per cent from June loadings, according to monthly truck loadings figures of the American Trucking Associations, but trucking of petroleum products showed an increase of 2.73 per cent in the same period.

July trucking of petroleum products was 40 per cent above July 1936, while trucking of general commodities (including petroleum) increased in volume by only 3.89 per cent, ATA said.

Says Chemical Pretreatment Helps in Diesel Lubrication

By M. G. VAN VOORHIS
N. P. N. Staff Writer

STATE COLLEGE, Pa., Aug. 21. — Discussions of diesel engine design, fuels, and lubricants featured the Oil and Gas Power Division meeting of the American Society of Mechanical Engineers here Aug. 18-21. A record attendance of nearly 300 was registered.

After a survey of recent developments, problems of high speed diesels were attacked. It was generally agreed that both engine design and fuel and lubricant specifications have not yet approached a permanent basis. Some of the devices of engine and accessory design and of fuel and lubricant specifications now being tried were viewed askance. Needed improvements may be made later in simpler ways by improved design, it was suggested.

One of the principal difficulties has been the lack of correlation between tests of fuels in the laboratory and in service engines. W. F. Joachim, senior mechanical engineer, U. S. Naval Engineering Experiment Station, presented some exhaustive data on this subject which classified 25 different, undoped diesel fuels by analysis and 13 ignition quality indexes were plotted against performance. Eighty-three different fuels of all types were then tested in correlating the best five ignition quality indexes.

Mr. Joachim found that for all types of fuels, only an engine test based on ignition delay or combustion shock measurements could be relied upon to predict fuel performance in service engines. Only the knock-meter-delay cetane number on the C. F. R. engine and the ignition delay cetane number from the Winton engine correlated with service engine fuel performance.

Greatest laboratory accuracy was found in the modified magnetic pick-up rating method of testing fuel quality. It was said to have satisfactory correlation with service engine tests and efficient testing time in comparison with other methods. The method was said to be superior to the present knock-meter-delay method, but it was believed necessary that more fuels should be tested by this and other methods by a greater number of laboratories and the results correlated with several types of service diesel engines before final conclusions are drawn.

The U. S. Navy's object in this investigation is the object of all—to establish standard specifications for a single grade of fuel for use in several types of diesel engines and the study of engine design characteristics which will ultimately lead to development of an engine that will be independent of as many limiting characteristics as possible.

Chemical pretreatment of surfaces to be lubricated is one of the newest ideas to be tried to accomplish objectives aimed at with doped lubricating oil. This quite recent idea is being tried by Caterpillar Tractor Co. it was disclosed by A. T. McDonald who read C. G. A. Rosen's paper on Lubrication Problems in High Speed Diesel Engines.

Material improvements have been made in break-in of cylinder and ring surfaces, it was stated. Chemically treated surfaces have been found to produce extreme pressure characteristics and to hasten spread of the lubricant during the break-in period. By transforming the cylinder surface to a blotter-like material, the lubricant is absorbed quickly and adhered tenaciously, thus permitting a rapid form of mild abrasion which produces superior wear surfaces, it was indicated.

By this process piston rings which normally required about 100 hours to obtain full ring face conditioning and 100 per cent bearing face can be run in to comparable surface contacts in three hours time, it was said. Use of addition agents was lauded again by Mr. Rosen in reference to "superior operating benefits derived by the use of selected additives". These oils are "of such economic importance that their progress cannot be denied."

Filter benefits to diesel lubricants are controversial, it was pointed out. Effective elimination of abrasive, metal particles and water are essential but a filter can be advantageous in removing sludges and crankcase depositions. They do not offer guarantee to efficiently removing ring sticking binders. Some types of filters remove compounded oils.

E. J. Kates, consulting engineer, New York, stated in discussion that more effort should be directed to filter design so that they would take out the undesirable materials formed in a lubricating oil rather than spend time on addition agents.

A diesel engine that runs on natural gas without making major changes was described in manufacturers' progress reports by Nordberg Mfg. Co. as a development of the past year. Either fuel is burned on the diesel cycle. An engine of this type is in operation in the Municipal Power Plant at Lubbock, Texas. Proper operation of this engine requires a "kindling medium", i.e. a small amount of fuel oil is injected with each charge of gas. Operation with gas at Lubbock is said to be 44 per cent lower than with oil. It would seem a short step to burning gasoline on the diesel cycle with this achievement.

General Motors Corp. is still not in a position to disclose details of the high speed diesel engine to be built at its new plant under construction near Detroit now, according to F. G. Shoemaker who made this company's report. Buda Co. has developed several new engine sizes the past year for all purposes including automotive. Hercules Motors Corp. is now developing a new series of lower power and cost, high-speed, heavy-duty, full diesel engine.

Acceptance of diesels for bus service was given a boost by Martin Schreiber, Public Service Co-ordinated Transport Co., Newark, who painted a glowing picture of the service 27 diesel-electric buses now on trial are giving. No babying for these buses such as special fuels or lubricants, no special mechanics to service them, are required, yet they operate better and cost less to run than gasoline buses on the same runs, Schreiber said. It is all hokem about diesels being good only for long hauls, he said. On these runs 2400 stops and starts are made on a 20-mile line with seven or eight stops per mile with four drivers at the wheel in 24 hours. Such service will eliminate gasoline driven buses in another five years, said Schreiber. Discussion dimmed the glow a little, particularly the unanswered question as to when Schreiber's 2700 buses would all be diesel driven.

E. C. Magdeburger's paper on U. S. Navy Participation in Diesel Engine Development dealt with the restrictions to be met and the state of advancement of other nations such as Germany, now leading in development of naval diesel engines.

Among the specialized research problems was that of flywheel effect and speed regulation for diesel-driven machinery. A solution was presented by A. D. Andriola, Electric Boat Co., Groton, Conn. Directly related to the prominent problem of injection was the paper of K. J. DeJuhasz, Pennsylvania State College, on the Determination of the Rate of Discharge in Jerk-Pump Fuel-Injection Systems. Treatment was concerned with the compressibility of oil fuel and the existence of wave-formation pressure layers in the feed line. These were illustrated by models and charts. J. S. Chandler, Pennsylvania State College, described the Penn State method of diesel fuel testing which employs an all electric method of determining ignition lag.

Glenn C. Boyer's paper on waste heat recovery dealt with the heat analysis of the diesel engine and the uses to which waste heat from the exhaust or circulating water could be put. The heating of buildings was principal use for which a detailed discussion was given of methods.

W. B. Walraven, Springfield, Ill., has adapted a gas engine to use sewage gas and told his audience about how much horsepower could be obtained per capita. Fifty engines of this type are now in use. At Peoria where 110,000 people are served, two 835 Hp. engines are kept running continuously and still 250,000 cubic feet of gas is wasted daily.

W. H. Hubner, Universal Oil Products Co., closed the meeting with an assurance of plenty of fuel available for diesel engines and an outline of the methods for getting the fuel. He also discussed briefly some of the fuels now being used, including fuel dopes.

Federal Oil Taxes Up In July

N. P. N. News Bureau

WASHINGTON, Aug. 23. — Federal government income from the four major taxes on the petroleum industry amounted to $25,032,834.50 in July this year, compared with $17,761,173.88 in the same month last year, according to the Internal Revenue Bureau.

The July collections for each of the four taxes, together with those for the same month last year, follow;

	1937	1936
Gasoline	$19,471,054.93	$14,512,178.75
Lubricating Oils	4,371,623.50	2,311,106.39
Transportation of Oil by Pipe Line	1,105,461.04	866,406.75
Crude Petroleum Processed, etc.	84,695.03	71,481.99
Total	$25,032,834.50	$17,761,173.88

Cryden Operates Inland Plant at Drayton Plains

MT. PLEASANT, Mich., Aug. 23. — Cryden Refineries, Inc., has taken over the Inland Refining Co. plant at Drayton Plains, Michigan, according to Alan S. Gray, chairman of the board and treasurer of the Cryden company.

The Inland refinery, which has a capacity for 1500 barrels of crude oil daily, was built in 1936, but was operated only for several weeks. The plant has been entirely reconditioned by the Cryden company, which is a newly formed subsidiary of the Cryden Petroleum Corp.

Mr. Gray pointed out that the affiliation of the new company with Cryden Petroleum Corp., a producing company, will assure an adequate and constant supply of crude for the refinery.

Officers of the new refining company, besides Mr. Gray, are: Raymond S. Hunt, president, and William B. Hartman, secretary. John Helms, formerly superintendent of Naph-Sol plant at Muskegon will assume a similar capacity at the Cryden plant. Charles Harris, formerly with Leonard Refineries, Inc., is office manager.

'Whys' Of Oil Prices To Be Explained

NEW YORK, Aug. 23.—A new policy of public relationship in regard to changes in wholesale oil prices was announced today by W. S. Farish, president of Standard Oil Co. (N. J.) for its domestic marketing affiliates.

Believing that "people are interested in and have a right to know what makes the things they buy cost what they do," the Esso group will endeavor, he said, to accompany any important adjustment in prices of leading products with a statement giving the reasons for it.

"Let us admit that this philosophy of frankness in price making is one the significance of which industry as a whole has in the past been slow to appreciate," Farish said. "But many observers believe the time will come when the principle of fair prices openly arrived at will be as generally accepted as the annual stockholders' report. Understanding and good will are the best insurance known against prejudice, fair and open dealing the best guarantees of continued confidence and friendship," he continued.

In spite of increased labor costs, transportation expenses, materials, taxes, interest rates and other items, the average price of gasoline in the United States had advanced only 11.8 per cent since the low point of the depression in June, 1932, while the price of all commodities has gone up 36.5 per cent, Farish added.

Vapor Lock Studied

TULSA, Aug. 24.—Field work has been conducted under the auspices of the Natural Gasoline Assn. of America and the Western Petroleum Refiners Assn. in connection with a study of vapor locking tendencies of fuel systems of various makes of automobiles was ended today. Rhea Couch, director of the field work, and two assistants will spend several days in Tulsa preparing the data for submission to the American Petroleum Institute correlation committee. The steering committees of both associations met August 23 at the field headquarters and canvassed the results.

J. D. Collett, Jr.

HOUSTON—J. Daviss Collett, Jr., announces the opening of an office in the Shell Building, Houston. He is a consulting petroleum and production engineer and will specialize in bottom hole pressure surveys, lease operations and evaluations. Mr. Collett is the son of J. D. Collett, Fort Worth producer and president of the Mid-Continent Oil & Gas Association.

Rails Defend 'Grandfather' Truckers Against Inroads Of 'Young Uns'

N. P. N. News Bureau

WASHINGTON, August 16.—The strange spectacle of a group of powerful western railroads "going to bat" for truckers of petroleum products is presented in a petition filed today with Interstate Commerce Commission asking reargument and reconsideration by the entire commission of a case in which contract carrier permits were granted to five Nebraska and Kansas petroleum haulers.

Truckers whose permits are attacked by the rails include McGill Oil Co., Garland, Nebr.; Jason W. House, Silver Creek, Nebr.; E. L. Peters, Mankato, Kans.; C. W. Fleek, Jr., Spalding, Nebr., and Jacob Niederhaus, Lincoln, Nebr., who made up the group whose cases were heard in the first oral argument before the ICC in an oil trucking case last December.

The railroads' petition contends that the commission granted the permits of the five without taking into consideration the prior rights of "grandfather" truckers—haulers who were operating before July 1, 1935—and urges that the commission proceed with "extreme caution" because the case is of "utmost importance."

The railroads contend, on behalf of the "grandfather" truckers, presumably, since no mention is made in their petition of injury to the rails, that the commission placed the burden of proof on the "grandfather" truckers in its hearings and argument. The burden of proof, the rails say, should be with the applicants. Especially, they objected to the section of the commission's report granting the five permits which reads:

"In the absence of evidence that the operations proposed would affect other carriers by motor vehicle now lawfully engaged (in the same sort of transportation) . . . . or that these applicants are not fit, willing and able to provide transportation as contract carriers, there is no valid basis for denying" their applications.

Oversupply Claimed

The applicants should have been required to have furnished affirmative proof that existing facilities were not adequate, before their permits for new operations were granted, the rail petition claims, adding the opinion that an "oversupply" of truckers between Kansas refinery points and Nebraska destinations "probably exists."

Because of the large volume of truck traffic moving from Kansas refineries into Nebraska, the petition says, the final decision in this case will establish a precedent which the ICC may refer back to for years to come, therefore the commission should be doubly careful in its order.

The same line of argument was used by the rail protestants back in December, when the case was first heard by the ICC, causing Commissioner Joseph B. Eastman to inquire of E. M. Martin, Burlington railway lawyer, "Who are you representing —the railroad or these 'grandfather' truckers?"

Besides the Burlington, railroads mentioned in the petition include the Santa Fe, Missouri Pacific, North Western, Rock Island, and Union Pacific.

C.I.O. Postpones Parleys Among Unions, Shell

N. P. N. News Bureau

LOS ANGELES, Aug. 23. — Collective bargaining discussions begun July 13 among Shell Oil Co. and officials of labor unions in accordance with a National Labor Relations Board ruling June 1, have been postponed until late next month.

In the NLRB ruling Shell was ordered to withdraw all recognition from its conference delegate plan of employe bargaining and to negotiate with five labor unions as exclusive representatives of its workers.

The five unions included the C.I.O. affiliate, International Assn. of Oil Field, Gas Well & Refinery Workers, and the following groups affiliated with the A. F. of L.: International Assn. of Machinists; International Brotherhood of Boilermakers, Iron Shipbuilders and Helpers; International Brotherhood of Blacksmiths, Drop Forgers and Helpers, and International Brotherhood of Electrical Workers.

Postponement in deliberations was asked by C.I.O.

It was understood from other sources close to the situation, however, that the annual state federation of labor conference in Long Beach Sept. 13 was an important reason for the delay. Discussion is expected to originate on the floor of the A. F. of L. meet in connection with suspension of C.I.O. affiliated trade unions from the state federation.

Jurisdictional Dispute

Because the question of jurisdiction between the two groups was understood to have come up in the discussions with Shell, it was believed by observers that the oil workers union wanted to get the federation meet out of the way before continuing the case. It was also reported, but could not be confirmed, that Shell had questioned C.I.O. qualifications as a bargaining agent for Shell employes.

Another labor development on the Pacific Coast is scheduling for August 30, a hearing before the NLRB to determine whether an election should be held among workers in Standard Oil Co. of California's El Segundo refinery.

The oil workers union has asked for the election to determine preference of the workers for bargaining representatives. The selection would be between the C.I.O. and A.F. of L. groups and the independent union of company workers.

Congress Session Ends, Does Little

(*Continued from page* 28)

which the Administration sought. The latter is on the agenda for the "first order of business" when the next session opens in January — and there is a strong possibility that a special session may be summoned in November to consider this and other Administration bills.

Of the dozens of bills and resolutions introduced affecting the oil industry, only a few were passed, but others are well advanced in the legislative process, which will take up next January exactly where it left off in August.

The Connally "hot" oil law extension for two years was voted by both houses and signed by the President, although a determined stand was made against it by Independent jobbers under the banner of the National Oil Marketers' Association. Their efforts may be credited with the fact that the law, which prohibits interstate shipment of oil produced in violation of state laws, was not made permanent, as proposed by its author, Senator Tom Connally, Tex.

After extending the Connally Act, Congress appropriated $285,000 for its administration by the Interior Department's Petroleum Conservation Division.

Compact Extended

Another "extending" measure passed and signed was the resolution giving federal approval to a two-year extension of the interstate oil compact, ratified by six oil-producing states.

A two-year extension of the so-called "nuisance taxes"—including the federal gasoline and lubricating oil taxes, the import tax on petroleum products, and taxes on crude processing and transportation of oil by pipeline — likewise was voted by the legislators, despite their oft-repeated assertions that such taxes are of "emergency" nature, and should not be continued.

However, the Daly bill to repeal the import taxes on petroleum products still is pending in committee, and may be brought out at the next session. Another pending bill is that of Congressman Morgan Sanders, Tex., to increase the oil import taxes.

The bill of Congressman Patrick Boland, Pa., to tax all fuel oil used for heat or power purposes was referred to the House Ways and Means committee and hasn't stirred since.

Natural Gas Bill

Congressman Clarence F. Lea, Calif., piloted through the House his bill to give the Federal Power Commission regulatory power over interstate transportation and sale of natural gas, and it was reported out by the Senate Interstate Commerce committee, but did not pass.

But while the gas regulatory measure is stalemated for a time, at least, the Congress did pass a strict regulatory measure for the bituminous coal industry — the Guffey Law — and a similar bill was introduced to regulate the anthracite industry. The latter measure did not get out of committee.

The so-called "tax loophole" law is, of course, the big tax story of the session. Although President Roosevelt declared that the depletion allowance is one of the "most glaring loopholes" in the country's tax structure, the bill which Congress passed as a result of his message made no mention whatever of the depletion allowance.

Aimed primarily at personal holding companies, and other so-called "evasions," the law as passed exempts from the definition of "personal holding company income" the income from mineral, oil or gas royalties unless such income constitutes 50 per cent of the company's gross income.

It is expected that there will be a general overhauling of the federal tax structure next year. Whether the Treasury will renew its efforts to have Congress curtail or eliminate the depletion allowance, is not known. Treasury Secretary Morgenthau was behind the "tax evasion", the President's message, with its contention that the depletion allowance was a "loophole."

More than a dozen bills to amend the surtax on undistributed earnings were introduced but congressional leaders forestalled any action, despite signs of widespread support both on Capitol hill and among businessmen.

Pollution Sidetracked

Stream pollution warranted enough Congressional attention during the session to draw quite a number of bills providing for various shades of federal control. Most rigid of those introduced was the drastic Lonergan-Pfeiffer measure, which would have allowed the federal government to set up arbitrary "standards of purity" for virtually every stream in the country, and then give it the power to declare all violators of its "standards" to be common nuisances.

The House, however, passed the less stringent bill introduced by Congressman Fred Vinson, Ky., which would have provided for a study of the whole problem and would have authorized federal loans and grants to cities, states and industries to abate pollution.

When this measure went to the Senate for consideration, the Senate Commerce Committee inserted in it some of the federal enforcement provisions of the Lonergan bill, and the Senate passed it with the amendments.

A conference was called, but neither house would agree to the other's version of what a pollution law ought to be, and the result is that there was no pollution control law passed. The conferees are expected to report in January.

Neutrality Law

Oil apparently is not included in the list of "war materials" whose shipment to belligerent nations or factions the President is authorized to ban under the neutrality law passed at the session. However, the President in his discretion may put oil, along with wheat, cotton and other materials essential to the conduct of a war on a "come-and-get-it" basis as far as belligerents are concerned.

There is a possibility that some provisions of the neutrality act may be invoked in connection with the current Chinese-Japanese conflict.

Measures regarding public lands and Indian lands were introduced in profusion. A list of some of the more important ones affecting the oil industry includes:

Greever-O'Mahoney bill granting a two-year extension of oil and gas prospecting permits on public lands; passed by both houses and now before President for signature.

Nye resolution directing Attorney General to claim federal title to all oil-bearing lands lying off U. S. coasts between low-water mark and the three mile limit; passed by Senate, no action in House.

Walsh-Vinson bill to consolidate naval oil reserves in California by purchase or condemnation of privately-owned lands within the reserve boundaries —passed by Senate; hearings begun by House Naval Affairs Committee, but never completed.

Thomas bill giving Interior Secretary discretionary authority to allow gross-production taxes on oil and gas from restricted Indian lands in Oklahoma to be paid directly to the state, instead of being paid to him and then sent to the state

Net Earnings of Oil Industry Stand At 2.54 Per Cent, A. P. I. Reports

N. P. N. News Bureau

NEW YORK, Aug. 23.—Net earnings of the petroleum industry in 1936 nearly doubled those in 1935, but the return on invested capital stood at 2.54 per cent, according to the American Petroleum Institute.

Earnings for the industry as a whole have not exceeded five per cent in any year since 1921, and for three out of the past six years the industry accumulated deficits. For the 16 years from 1921 to 1936 average annual earnings were only 1.43 per cent on the invested capital, according to Institute figures. Although the industry has steadily expanded, increased competition, low prices, rapid obsolescence of equipment, and mounting taxes have tended to keep earnings at a low level, as evidenced in the following table of A.P.I.

Percentage Return on the Investment in the Petroleum Industry

Year	Investment	Net Earnings	Return
1921	$ 6,550,000,000	$—1,841,457	—0.03%
1922	7,877,375,000	221,615,211	2.81
1923	8,000,000,000	75,355,904	0.95
1924	9,150,871,000	227,938,411	2.49
1925	9,500,000,000	471,106,534	4.96
1926	10,000,000,000	475,393,629	4.75
1927	10,500,000,000	104,324,161	0.99
1928	11,000,000,000	386,516,430	3.51
1929	11,500,000,000	456,495,196	4.54
1930	12,000,000,000	92,439,088	1.38
1931	12,100,000,000	—333,903,133	—2.76
1932	12,200,000,000	—162,488,000	—1.33
1933	12,300,000,000	—123,097,000	—1.00
1934	12,700,000,000	59,304,437	0.47
1935	13,276,000,000	172,761,632	1.30
1936	13,775,000,000	349,664,240	2.54
Average	$10,776,828,000	$154,536,580	1.43

treasurer, as at present; passed both houses and sent to White House.

"Alky-Gas" Experiments

While the bill of Congressman Lea, Calif., to appropriate $1,000,000 for Department of Agriculture experiments in "the development of renewable sources of fuel supplies of agricultural origin for internal combustion engines" did not get out of the interstate commerce committee, two appropriation bills passed by the recent session carried items for experiments with synthetic fuels.

In the Agriculture Department bill, $15,000 was set aside for "alky gas" studies, and the sum of $25,000 was earmarked in the Interior Department appropriation bill for carrying on experiments by the Bureau of Mines in hydrogenation of coal. An experimental hydrogenation plant is operated by the Bureau at its Pittsburgh experiment station.

Among the many bills which bogged down behind the Supreme Court "packing case", never to reach the light again during the session, was the Pettengill bill to repeal the long-and-short haul clause of the Interstate Commerce Act so that railroads could cut their rates to meet truck and barge competition where they find it. This bill passed the House, but it stopped short when it was referred to the Senate Interstate Commerce Committee.

A bill to give the Interstate Commerce Commission regulatory authority over water carriers likewise was held up by the "more pressing" business of the session — the court bill — but it may come up at next regular session.

Forecasts Falter

For a while, back in May, there seemed to be a possibility that the Bureau of Mines' monthly forecasts of crude oil and motor fuel demand might be cut off short. In reporting out the Interior Department Appropriation bill, the House Appropriations Committee inserted a prohibition against use of any of the funds for forecasts.

Paul E. Hadlick, secretary of N. O. M. A., had appeared before the committee during hearings on the bill, and protested that these forecasts, coupled with the Connally "hot" oil law and the interstate oil compact, aid the major companies to "hold their grip on production and refining of oil, without any protection for either the Independent jobber or the consumer."

However, when the bill came up for discussion on the House floor, the ban on forecasts was stricken from it.

Four proposals, two in each house, to "disintegrate the integrated" failed to see any action at the session, but still are pending. They include the proposal of Congressman Fred Biermann and Senator Guy M. Gillette, both of Iowa, which would prohibit anyone engaged in production, refining or transportation of petroleum products from also engaging in the marketing end of the industry. These bills are pending before the House Interstate Commerce Committee and the Senate Judiciary Committee, respectively.

Pipeline Divorcement

Bills to divorce pipelines from control of oil companies also were introduced, in the Senate by Senator William E. Borah, Idaho, and in the House by Congressman J. B. Daly, Pa. They are pending before interstate commerce committees of both House and Senate.

Two other business regulatory proposals which would be felt in the oil industry were introduced by Congressman Wright Patman, Tex., but got no further at the recent session than the divorcement bills mentioned above. One of Patman's bills would divorce manufacturing from retailing, and the second would prohibit so called "reciprocal buying." Both are before the House Interstate Commerce Committee.

Congressman Lea's proposal to broaden the powers of the Federal Trade Commission was reported out by his Interstate Commerce Committee shortly before the session ended, but no further action was taken. The measure would extend FTC's authority to prevent "unfair and deceptive acts and practices in commerce."

At present the FTC is limited to prevention of unfair acts between competitors, but the proposed law would set it up as a "protector" of the public generally from whatever the commission may decide are "unfair or deceptive acts."

The helium export bill, which seemed to be dead for the session up to a few hours before adjournment, was one of the laws shot through the legislative mill during the last minutes. It will establish a government monopoly for production of the non-inflammable, buoyant gas, and will permit foreign countries to buy it for use in lighter-than-air craft as well as for scientific purposes. Proposed exports will be referred to the National Munitions Control Board and the Interior Secretary for approval, so as to prevent use of helium by foreign purchasers for military purposes.

Another bill passed in the session's final hours was a measure by Senator Ashurst, Arizona, authorizing the attorney general to retain Harry Blair, former assistant attorney general in charge of the justice department's lands division. as a special government counsel in the suits to test validity of the 3 per cent deduction for basic sediment and water from Osage Indian oil production.

Bills authorizing the President to invite foreign nations and states of this nation to participate in the Oil World Exposition at Houston October 11-16 this year, and the International Petroleum Exposition at Tulsa May 14-21 next year, await his signature also.

The usual grist of "super highway" proposals and similar schemes (all to be paid for out of gasoline tax money, presumably) were dumped in the Congressional hopper during the session, but for all the action they received, their authors might as well have saved their own time and the Government's paper and ink.

DAILY AVERAGE PRODUCTION IMPORTANT DISTRICTS
American Petroleum Inst. Figures

	Week Ended Aug. 21 Barrels	Aug. 14 Barrels
Oklahoma City	162,200	157,200
Total Okla.	653,600	648,900
East Texas	472,400	471,400
Total Texas	1,540,250	1,530,250
Rodessa	50,650	49,800
Total La.	263,100	261,700
California	675,000	676,400
E. of Rockies	3,054,350	3,042,200
Total U. S.	3,729,350	3,718,600
Crude Imports	116,570	117,860
Tot. new sup'ly	3,845,920	3,836,460

Bureau Predicts 10% Increase In September Gasoline Demand

N. P. N. News Bureau

WASHINGTON, Aug. 23. — September gasoline demand will reach 48,700,000 barrels—10 per cent above the actual demand in September last year—the Bureau of Mines estimates.

The September estimated demand is almost 4,000,000 barrels under the record-shattering demand forecast for August.

In addition, motor fuel exports for September have been estimated by the Bureau at 3,000,000 barrels, which is 100,000 barrels over the August estimate, and, according to B. of M. statisticians, is "in line with the upward trend in this (export) factor during recent months."

To meet this demand, daily average production of crude oil in September will be 3,509,300 barrels, the Bureau estimates, or 46,400 barrels above the daily average estimated for August. This is also 476,900 barrels, or 16 per cent, higher than the actual daily average for September last year.

Stocks of finished and unfinished gasoline amounted to 75,053,000 barrels on June 30, the Bureau reports, and they were reduced about 5,000,000 barrels during July. The Bureau estimates a withdrawal of 2,800,000 barrels during September, compared with an estimate of 5,000,000 barrels for August.

"Should all these estimates prove essentially correct," the Bureau says, "stocks of September 30 would amount to 62,200,000 barrels, or about 4,400,000 barrels above the level of September 30, 1936."

Adjusting for benzol and direct sales and losses of natural gasoline, estimated at 1,000,000 barrels, gasoline production to meet the demand in September will be 47,900,000 barrels, or 1,597,000 barrels daily, according to the Bureau. This is distributed among the refining districts, as follows:

East Coast	7,000,000
Appalachian	1,780,000
Indiana-Illinois	8,330,000
Oklahoma	3,150,000
Kansas-Missouri	2,730,000
Texas inland	3,740,000
Texas Gulf	10,840,000
Louisiana Gulf	1,510,000
North La.-Arkansas	910,000
Rocky Mountain	1,140,000
California	6,770,000
Total U. S.	47,900,000

Natural gasoline percentage in September is figured by the Bureau at 7.4, and the gasoline yield at 44.5 per cent, which, when applied to the estimated straight-run and cracked gasoline production of 44,360,000 barrels gives refinery requirements as 99,580,000 barrels of crude oil, a daily average of 3,319,000 barrels.

Following are the Bureau's estimates of daily crude production by states required to meet demand during September:

State	Forecast September 1937	Forecast August 1937	Actual production June 1937
Tex.	1,413,600	1,395,200	1,391,400
Calif.	638,200	612,800	663,800
Okla.	633,600	633,400	638,900
La.	247,900	253,900	257,100
Kans.	200,900	200,500	201,300
N. Mex.	101,400	100,800	111,000
Pa.	53,600	53,600	53,800
Wyo.	55,900	52,800	47,900
Mich.	40,400	39,900	40,600
Ark.	29,900	29,100	27,800
Mont.	18,200	17,700	17,600
Ky.	17,000	16,800	16,600
N. Y.	15,800	15,200	16,100
Ill.	14,600	13,000	15,400
W. Va.	10,300	10,700	11,100
Ohio	10,500	10,300	10,600
Colo.	5,000	4,900	3,600
Ind.	2,500	2,300	2,500
	3,509,300	3,462,900	3,527,100

ICC Joins Fight On Kentucky Law

N. P. N. News Bureau
WASHINGTON, Aug. 23. — Contending that the federal Motor Carrier Act "completely superseded and excluded state authority to restrict weight, height, size and length of commercial vehicles in interstate commerce," the Interstate Commerce Commission has intervened on behalf of the truckers who are challenging validity of Kentucky's 18,000 pound minimum weight law in a suit filed several weeks ago in federal district court at Frankfort, Ky.

The ICC claims the restrictive weight law is "invalid, as an undue and unlawful burden on interstate commerce" in its petition to intervene, and adds that "enforcement of such provisions of the Kentucky Statute will, unless restrained, interfere with and prevent the proper exercise by your petitioner of an exclusive function of federal government lawfully committed to it by a statute of the United States."

The suit, asking a permanent injunction against enforcement of the Kentucky law, was prepared by American Trucking Associations, Inc., and the Motor Truck Club of Kentucky, and the complaint lists 35 truckers and shippers by truck as complainants against state officials charged with enforcement of the act.

The Kentucky law, says the ICC petition to intervene, "subverts the policies of congress as provided by the Motor Carrier Act, and casts an undue and unwarranted burden on interstate commerce."

The ICC intervened in the ATA's suit for an injunction against the restrictive 20,000 pound maximum truck law of South Carolina earlier in the year, but, although the federal court held the law was an undue burden on trucks in interstate commerce, it did not mention the ICC contention as to the Motor Carrier Act in its opinion.

The South Carolina case has been appealed to the U. S. Supreme Court by South Carolina authorities.

Trinidad Oil Lease

LONDON—After a delay of nine months, the Premier (Trinidad) Oilfields has floated an issue of 540,788 ordinary 5-shilling shares on the London market. This company originally offered the shares to the public on November 5, but the Governor of Trinidad stepped in and refused his consent to the necessary assignment of titles, so the money was refunded.

The company has now obtained a direct lease from the Governor for 20 years, in place of the old one with nine years unexpired, which was originally to have been transferred.

The scope of the company's operations, however, has been narrowed to include only the Stollmeyer area, about 500 acres, which has been perfunctorily worked for several years.

The first twelve months' program consists of the drilling of 20 wells to the "third series" of oil sands from about 2,425 to 2,550 feet. Working capital to finance these developments will be £108,100 ($540,500).

Pettengill To Quit

N. P. N. News Bureau
WASHINGTON, Aug. 23.—Samuel B. Pettengill, Congressman from the third Indiana district, has announced that he will not be a candidate for re-election.

Pettengill, who was a member of the "Cole Committee" which investigated the oil industry several years ago and who wrote the book "Hot Oil" as a result of his observations in connection with this investigation, said that four terms in Congress was "enough for any man."

The Indianan, who said he is going back to his private practice of law in Indiana, asserted: "I would not wish to remain here the rest of my life, even if the people were kind enough to elect me."

Reparations Asked

WASHINGTON, Aug. 23.—Reparations of about $350 are sought by Tide Water Associated Oil Co. in a complaint filed with Interstate Commerce Commission charging that rates assessed against the company by railroads which hauled 18 tank carloads of motor fuel anti-knock compound from Carney's Point, N. J., to Drumright, Okla., in 1934 and 1935 were "unreasonable." Tide Water contends the rates, $1.62 per 100 pounds, were in excess of the aggregate of rates to intermediate points, and thus in violation of section 4 of the Interstate Commerce Act.

Office Moved

CHICAGO, Aug. 23.—The public relations department of Standard Oil Co. of Indiana has moved to new quarters on the fifteenth floor of 910 S. Michigan Ave., Chicago.

Tideland Question Goes Over Until Next Congress Session

N. P. N. News Bureau
WASHINGTON, August 23.—Senator Gerald P. Nye's resolution to "assert" U. S. title to all oil-bearing lands lying off the coasts of the U. S. between low water mark and the three mile limit got no further than passage by the Senate and reference to the House Judiciary committee at the recently finished session.

However, according to Justice Department officials, it follows their recommendations, sent after they were asked their opinion on the original Nye tidelands bill. (N.P.N., August 18, P. 29.)

At the Justice department it was said the original bill might involve expenditures of millions of dollars by the United States, since it was "legislative taking," but it is concluded that the Nye resolution, which hangs over until the next session of the 75th Congress, may "assert" U. S. title to the lands. Of course, a lawsuit may result, but a favorable decision will clear the slate, and all the tidelands will be U. S. property.

However, the officials of various states involved have in their favor a decision made in 1934 by First Assistant Interior Secretary Walters, in which he noted a U. S. Supreme Court decision to the effect that "it is the settled rule in this court that absolute property in and dominion and sovereignty over the soil under the tide waters in the original states were reserved to the several states and that the new states since admitted have the same rights, sovereignty and jurisdiction in that behalf as the original states possess within their respective borders."

Walters also added as his own comment: "It is clear that this department has no jurisdiction. The state of California asserts title to tide and submerged lands under the common law as it has repeatedly been laid down by the Supreme Court of the United States. If any question of title to such lands as between the state of California and the United States is to be tried, it is for the federal courts."

Majors Follow In Price War

PITTSBURGH, Aug. 24.—Major oil companies dropped prices at company-operated stations to 18 cents, the latest development today in a series since an upset in the retail gasoline market in Allegheny County.

Many stations were reported operating at a loss since a price decline of as much as five cents per gallon of gasoline. Prices reached a low of 15 cents, including five cents tax.

Pennsylvania's new price posting law prohibits discounts, but does not fix prices. Since the law went into effect Aug. 1 low net signs appeared and the war followed.

La. Oil Refng. Corp. 77b Plan Upheld

SHREVEPORT, La., Aug. 23.—Objections of preferred stockholders to the reorganization plan for Louisiana Oil Refining Corp., under Section 77b of the bankruptcy law, were overruled in a decision filed here Aug. 20 by Federal District Judge Dawkins.

On April 10, the fifth circuit court upheld, insofar as it applied to the common stockholders, Judge Dawkins' decree confirming the plan but sent it back for a decision on the attempt of a group of preferred stockholders to withdraw their acceptance of the plan.

During the two years that the reorganization was pending, according to this stockholder group, oil properties in Louisiana and Texas belonging to a subsidiary of the debtor corporation had so enhanced in value as to make the settlement inequitable.

Judge Dawkins overruled this and other objections, holding that the group had acted too late. He ruled that the $25 (or equivalent in common stock of Arkansas Fuel Oil Co.) offered for each share of preferred in the debtor corporation was all that the holders "are entitled to receive."

27% Of 'Gas' Is Tax-Free

WICHITA, Aug. 23.—Tax-free gasoline amounted to 27.7 per cent of total consumption in Kansas during the fiscal year ended June 1, 1937, according to report from the state department.

Total of 122,460,105 gallons of gasoline escaped taxation under exemptions allowed to farmers for non-highway use.

Crude Stocks Decline; Still Above '36

N. P. N. News Bureau

WASHINGTON, Aug. 23. — Stocks of crude petroleum declined 328,000 barrels during the first week in August, to reach 307,922,000 barrels on August 7. Despite the decline, August 7 stocks were more than 2,500,000 barrels in advance of those on a comparable date a year ago—August 8—when they stood at 305,315,000 barrels.

Stocks by grades, showing changes between the weeks ended July 31 and August 7, follow, in thousands of barrels:

Grade of Crude Oil	July 31	Aug. 7	Change from July 31
Penna. Grade	3,988	4,096	+108
Other Appal.	804	847	+ 43
Lima-N. E. Ind.-Mich.	1,490	1,324	—166
Ill.-S.W. Ind.	9,619	9,651	+ 32
N. La. & Ark.	9,746	10,289	+543
W. Texas and S.E. N. Mex.	30,893	30,375	—518
E. Texas	24,969	24,974	+ 5
Other M.-Cont.	127,612	128,285	+673
Gulf Coast	25,135	24,882	—253
Rocky Mt.	24,512	24,364	—148
California	28,390	27,491	—899
Foreign	2,642	2,844	+202
Tot. rptd. wkly.	289,800	289,422	—378
Estimates of unrptd. stks.	18,450	18,500	+ 50
Tot. stocks	308,250	307,922	—328

New Pipeline Survey

SHREVEPORT—Survey is being made by Caddo Pipe Line Corp., subsidiary of Grogan Oil Co., for six-inch pipeline from the Lisbon field, Claiborne parish, to Homer, La., where the line will connect with Louisiana Oil Refining Corp.'s trunk line from Haynesville to Shreveport. The Lisbon field is developing rapidly and at present has only one pipeline outlet.

Indiana Consumption Up 10%

INDIANAPOLIS, Aug. 23. — Gasoline consumption in Indiana during June this year increased slightly more than 10 per cent over June, 1936, and recorded a new high consumption mark for the month in that state, gallonage report from the state auditor's office revealed.

Total consumption in June this year was 58,128,922 gallons, or 6,335,726 gallons higher than the 51,793,196 gallons consumed in June, 1936, which also was the last previous high for the month in that state.

Collections for June consumption under Indiana's 4 cent state gasoline tax were $2,325,319.

New Gasoline Plant In Flour Bluff

By Teletype
N. P. N. News Bureau

TULSA, Aug. 23. — The Humble Oil & Refining Co., will build a gasoline plant of combination absorption compression type in the Flour Bluff field, near Corpus Christi. Petroleum Engineering, Inc., of Tulsa will have the contract for construction. The plant will have capacity to process 15,000,000 cubic feet of gas daily and will cost approximately $300,000.

Atlantic 'Poly' Plant

PHILADELPHIA, Aug. 23.—The Atlantic Refining Co.'s new thermal polymerization plant, which has been under construction at its Point Breeze refinery since the first of the year, is now in operation. The plant is the largest of its type in the world and will be capable of producing 62,500 gallons of blending stock a day.

Total cost of Atlantic's new polymerization plant is in the neighborhood of $2,100,000.

Acetylene Meeting

NEW YORK, Aug. 23.—The International Acetylene Assn. will hold its annual convention in Birmingham, Ala., Nov. 10-12. Program details are to be announced later. Oxy-acetylene welding and cutting will be featured at all sessions.

Motor Fuel Stocks In Year's Record Decline—1,727,000 Barrels

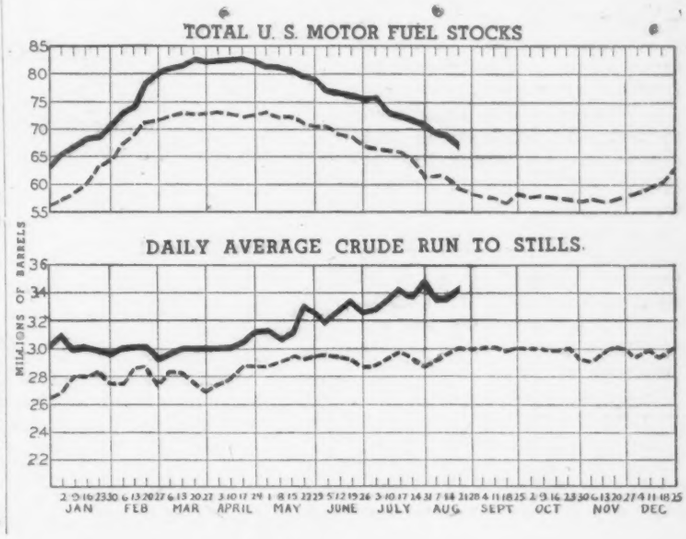
By Teletype
N. P. N. News Bureau

NEW YORK, Aug. 24.—The largest, so far, decrease in motor fuel stocks in the U. S. was reported the past week, when these stocks fell 1,727,000 barrels, to 63,630,000 barrels the week ended Aug. 21, according to the American Petroleum Institute. Responsible for a major part of this decrease was the Texas Gulf district, where stocks were lowered 708,000 barrels, despite an increase of 18,000 barrels in daily average crude runs to stills.

Crude runs to refinery stills increased 73,000 barrels over the previous week, to 3,111,000 barrels daily average the week ended Aug. 21. Among the districts reporting larger increases, aside from the Texas Gulf, were East Coast, with an increase of 23,000 barrels; Oklahoma-Kansas-Missouri, 18,000 barrels; and California, 11,000 barrels. Three districts reported small decreases in runs.

All but one refining district reported decreases in stocks of motor fuel. The one was Louisiana Gulf where stocks gained 260,000 barrels. Aside from the Texas Gulf decrease, these others chalked up considerable declines; East Coast, 338,000 barrels; Indiana-Illinois-Kentucky, 217,000 barrels; Inland Texas, 119,000 barrels; and California, 453,000 barrels.

By location, motor fuel stocks declined: 1,301,000 at refineries, standing at 33,563,000 barrels on Aug. 21; 373,000 barrels, in transit and at terminals, to 22,904,000 barrels; and unfinished gasoline, 53,000 barrels, to 7,163,000 barrels.



CURRENT REFINERY OPERATIONS

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks Thousands of Barrels Total Finished and Unfinished Motor Fuel*		Gas & Fuel Oil		% Total Capacity Reporting	Cracked Gasoline Production Daily Av. Production (Barrels) Week Ended	
		Aug. 21	Aug. 14	Aug. 21	Aug. 14	Aug. 21	Aug. 14	Aug. 21	Aug. 14		Aug. 21	Aug. 14
East Coast	100.0	579,000	556,000	86.5	83.1	18,353	18,691	12,903	12,344	100.0	117,000	127,000
Appalachian	88.4	103,000	103,000	79.8	83.7	2,626	2,664	847	871	94.6	25,000	27,000
Ind., Ill., Ky.	92.4	442,000	442,000	90.4	90.4	11,297	11,514	6,741	6,558	98.5	137,000	136,000
Okla., Kans., Mo.	84.7	327,000	308,000	85.4	80.4	6,673	6,710	3,390	3,396	90.3	75,000	77,000
Inland Texas	56.6	136,000	139,000	67.7	69.2	1,767	1,886	1,748	1,706	71.7	32,000	35,000
Texas Gulf	95.5	746,000	728,000	98.5	96.2	7,109	7,817	9,441	9,369	98.0	163,000	151,000
La. Gulf	96.6	137,000	132,000	81.5	78.6	1,869	1,609	2,670	2,484	100.0	25,000	30,000
No. La., Ark.	63.7	42,000	34,000	72.4	58.6	409	452	379	408	77.5	8,000	7,000
Rocky Mt.	69.7	52,000	55,000	83.9	88.7	1,431	1,465	784	788	87.4	14,000	16,000
California	90.9	547,000	536,000	73.3	71.8	12,096	12,549	68,520	68,770	98.0	65,000	69,000
Total Reporting	88.9	3,111,000	3,038,000	85.0	83.0	63,630	65,357	107,423	106,694	94.8	661,000	675,000
Estimated U. S. Total (Bur. of Mines Basis)		3,415,000	3,340,000			67,290	69,087	110,493	109,644		730,000	745,000

*Includes stocks at refineries, in bulk terminals, pipe lines and in transit.

Pacific Firms Extend Tank Wagon Dumps

N. P. N. News Bureau

LOS ANGELES, Aug. 21. — Principal California marketing companies have posted notices that the policy of making deliveries of gasoline by tank truck direct into fuel tanks of power shovels, tractors and ditch diggers operated by contractors on the job has been extended to include other contractor equipment, such as motor trucks. The 40-gallon minimum delivery provision still holds, however.

The posting of this notice is in compliance with the 1931 marketing practices code as approved by the Federal Trade Commission and as interpreted by California oil companies in 1936.

Under its rules California companies posted established wholesale and retail prices on products, were required to make public any deviation from these postings and to divulge any important change in operating practices which might affect the market.

Last week Union Oil Co. posted notice that to meet the competition of mid-west refiners it had quoted a price of 8.593 cents on 38,000 gallons of "Q" grade gasoline for delivery to Grand Canyon, Arizona, between August 12 and December 31, 1937. The price was f.o.b. the company's Wilmington refinery and compared with a regular posted price of 9.75 for this product. Delivery will be made in tank cars under a contract with the National Park Service, Department of Interior.

Lower Rate Proposed For Montana Oils

N. P. N. News Bureau

WASHINGTON, Aug. 23.—Independent Refining Co. and Yale Oil Corp., both of Billings, Mont., have achieved the first step on their way to a favorable Interstate Commerce Commission ruling on their complaint that railroads charge more to ship their products to Dakota and Minnesota points than they charge shippers from Wyoming and Oklahoma points the same distance and further from the same destination. (N.P.N., Mar. 17, p. 21.)

An ICC examiner has recommended to the commission that it establish new lower rates, chiefly on asphalt and road oil, from the Montana refiners, asserting that "certainly with rates relatively and in many instances absolutely much higher than those from competing origins complainants are denied any real opportunity to compete in this destination area."

The recommended report of the examiner points out that "the destination territory here considered is highly competitive, and the cost of transportation is an important factor in enabling a refiner or carrier to meet this competition."

Tax Killed as Dealers March on Council

By Teletype

RICHMOND, Va., Aug. 24.—A battalion of more than 200 service station operators last night was instrumental in killing the proposed city tax of $1 per front foot on all service station and parking lot drives.

The operators, headed by William Propst, operator of several stations, appeared at a hearing of the City Council.

"We are going to start a campaign to eliminate some of the seven or eight other direct taxes which Richmond has placed on service station operators, such as grease and wash rack taxes, machinery taxes, and taxes of all sorts," Propst said.

After the hearing the councilmen announced the driveway tax proposal be discarded.

The city attorney had expressed the opinion that the proposed driveway tax would be illegal.

Pump Executive Dies

LOS ANGELES — Alexander G. McKenna, chairman of the Pomona Pump Co., Pomona, Calif., died July 29. Death followed a seven weeks' illness. Although 72 years of age, Mr. McKenna took an active part in his business up until the time he was confined to the hospital. Mr. McKenna had been engaged in manufacturing for more than half a century. Together with his son, G. A. McKenna, he purchased the Pomona Pump Co. in 1923.

Oil Official Dies

NEW YORK, Aug. 23.—John Howard Jordain, manager, of the Socony-Vacuum Oil Co.'s interests in Spain for the past 12 years was killed Aug. 19 in an automobile accident near Valencia, Spain, according to word received here.

Mr. Jordain is survived by his widow and three children. He had been active in helping American refugees in Spain since the outbreak of the civil war there.

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Technology and Publicity

By ARCH L. FOSTER, N. P. N. Technical Editor

THESE technical men are amusing critters sometimes.

A new development of some sort reaches the commercial or semi-commercial stage—but nothing must be said about it. It is a deep if not dark secret, knowledge of which would upset the mental equilibrium of the industry. Then, if a licensable proposition, the sales boys start their spellbinding, usually on a few choice customers—but nothing must be said in print, that would ruin the picture.

A plant-size unit is built, or several; "bugs" are chased out of them, as is invariably the case with new stuff; eventually results pan out satisfactorily, and Bang!—the story is told in all its "gruesome (?)" details to a waiting world, all of whom, who amount to anything, know the essentials already! And there you are.

Albeit there is method in their "madness." The hypercaution which makes science safe for itself, for the human race, continuously rides their shoulders, to avoid publicizing errors, to avoid going off half-cocked, makes for the health of the industry, in the final analysis.

Yet, all in all—They're great Kidders sometimes, ain't they?

Benzine, Kogasin, and Hydrogenation

Very reliable information states that Germany, in the last 18 months, has manufactured 700,000 tons of "benzine" from kogasin, or about five million barrels of motor fuel. During the same time about 1,300,000 tons, or approximately 9,000,000 barrels of benzine has been produced by coal hydrogenation. If so, then Germany is producing a large part of her motor fuel requirements without recourse to either "capitalistic" or "communistic" countries.

So far, so good. But what about the economics of such a procedure? This benzine cost more to manufacture than does gasoline from petroleum. Even dictators at home or abroad cannot set aside indefinitely the law of supply and demand, or repeal the laws of mathematics or economics. Some part of the German industry, the German people, must pay the subsidy to cover the extra overhead, the higher costs. And that part of the nation will eventually get tired of doing just that. The benefits of national political autonomy are incalculable. The cost of national economic independence may well be higher than even a long-suffering people can or will pay.

Great Britain has made about three per cent of her motor fuel needs via coal hydrogenation at the Billingham plant, reports say. Technically this operation is a beautiful success, engineers say who are qualified to judge and to compare technical developments. Economically the situation is at variance. In England this hydrogenated fuel enjoys a subsidy—for that is what it amounts to—of eight pence (about 15 cents) the English fuel tax, which subsidy the petroleum industry and the British industry must pay.

What will be the answer?

Propane and Asphalt

We are beginning to learn what propane can do to a crude which is too crude for the lubricating oil maker's tastes. Asphaltic materials are undesirable in lubes, the technologists say. Propane, properly liquefied and mixed with crude lube fractions, eliminates essentially all the asphaltic and resinous material in Mid-Continent and other crudes, raising V.I., stability and lubricating efficiency. Dr. W. H. Bahlke and his collaborators tell us how in this issue.

A very few years ago a well known refiner of Pennsylvania crude was much upset and in a disagreeing mood when a technical man remarked about the amount of "asphaltic and resinous material" which can be extracted from what is generally considered the best lube crude on earth. That same refiner is now removing that objectionable material with propane, making a fine oil a much better oil in so doing.

Refining Technology

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Standard Oil Co. of Indiana precipitates asphalt from raw lube stock from Mid-Continent crude in propane at 200 pounds pressure. The deasphalted oil in propane solution is treated with acid continuously. By this method losses and costs are reduced and product is improved.

Wilshire Starting Poly. Unit and H_2S Removal Plant . . . by Jack N. Westsmith..... R-129

Wilshire Oil Co. is placing in operation a new Universal catalytic polymerization plant for the production of 82 octane blending stock. Gas run through the plant will be treated for removal of hydrogen sulfide.

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Super Fuels for Faster Flying . . . by Arch L. Foster 33

U. S. military establishment will require 60,000,000 gallons per year of 100 octane gasoline by next year. Private flying will use another 8,000,000 to 12,000,000 gallons. Oil companies now are prepared to meet this demand for super-fuels.

Refining Costs Reduced, Bright Stock Qualities Imp

By W. H. BAHLKE[1], E. W. THIELE[1], C. E. ADAMS[1] and B. GINSBERG[1]

Abstract

● Forty-one gallons of by-products from the new propane-acid refining of bright and cylinder stocks as compared to 119.5 gallons from the old method is part of the improvement shown by Standard of Indiana on commercial operation to produce the Whiting refinery's total requirement for these products. Specific losses are reduced from 7.5 gallons per 100 gallons of product, to zero loss.

Asphalt is precipitated from the raw stock in propane under 200 pounds pressure. Deasphalted oil in propane dilution is treated continuously, counter-current, with sulfuric acid. Acid of 93% strength is apparently the most efficient. Corrosion is slight except where acid, sludge, and steam are present. Lead-lined steel, brass, bronze or copper-nickel alloys may be used to avoid corrosion.

THE investigation which led to the installation of the plant to be described in this paper was undertaken with a view to finding a less expensive process for the manufacture of lubricating oils from Mid-Continent residuum which would also, if possible, make oils of improved quality. The process which was then in use, and had been in use for a long period of years, involved treating a long residuum (about 60% of the crude) with 91% sulfuric acid and neutralizing with caustic, the exact amount of acid used varying for various grades of finished oil. The treated residuum was reduced to viscosity and flash by fire and steam in atmospheric shell stills. That part of the product which was intended for bright stock of a superior green cast was then hot-contacted with fine clay. Subsequent steps involved cold settling and percolation in naphtha solution.

Preliminary tests and calculations showed that of the various possible improved processes, the most promising consisted in deasphalting and acid treating a short residuum in propane solution (as developed by Bray, U. S. Pat. 1,949,989), subsequent cold settling and percolation being conducted as before. Accordingly, experiments on both deasphalting and acid treating were undertaken, with a view to working out the details of the process and providing data for the design of a commercial plant to be erected at the refinery at Whiting, Indiana.

Laboratory Work on De-asphalting

The apparatus used in the study of deasphalting of Mid-Continent residuum is shown in Fig. 1, which is self-explanatory. The results obtained on residuums of various viscosities are summarized in Tables I, II and III and the pertinent data with regard to 298 Saybolt (210° F.) residuum, which was most thoroughly investigated, are shown graphically in Figs. 2, 3 and 4.

It will be noted that to attain a given result the temperature has to be higher for refinery propane than for pure propane. This is probably due to the butane content rather than the unsaturate content, since glass-tube studies have demonstrated that the solubility relations of oil and propane are quite similar to those of oil and propylene, but different from those of oil and butane in the required direction.

Examination of Fig. 4 shows that the color of the oil obtained becomes lighter as the percentage of propane is increased or the temperature is raised. The former

*Rewritten by the authors from 2nd World Congress Paper, 1937.
[1] Standard Oil Co. (Indiana).

TABLE I

Deasphalting 298 Viscosity at 210° F. Saybolt Mid-Continent Residuum in Propane.

	Resid Gravity 18.0°API													
Run No.	**59**	**52**	**57**	**62**	**63**	**66**	**60**	**65**	**67**	**97**	**98**	**94**	**61**	**56**
Kind of Propane	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Vol. Propane/Vol. Resid.	2.3	4.0	5.7	10.1	2.4	2.3	4.0	11.5	2.3	2.3	3.0	2.3	2.4	3.0
Deasphalting Temp. °F.	103	106	102	102	135	136	138	136	151	157	157	161	167	164
Deasphalting Press. Lb. Gauge	...	205	...	...	...	...	...	280	...	...	...	...	...	...
Vol. % Propane in: Upper Layer	68	81	87	92	74	71	83	94	70	...	...	...	82	87
Vol. % Propane in: Lower Layer	..	45	44	..	43	..	51	47.5	..	..	..	..	58	55
Deasphalted and Depropanized Upper Layer:														
Vis. at 210° F. Say.	233	182	168	153	215	232	153	139	238	192	139	166	115	104
Gravity °API	19.7	20.8	22.0	22.0	20.3	20.2	22.1	22.2	19.6	20.3	22.6	21.4	23.3	23.6
Color in 85% W. W.	1/16R	⅜ R	¾ R	1⅛ R	⅛ R	1/16R	⅜ R	2⅛ R	1/16R	3/16R	⅞ R	⅛ R	⅞ R	2⅝ R
Carbon Residue	4.38	...	2.85	...	...	...	...	...	...	...	...	...	2.4	...
Vis. Grav. Constant	.854	.849	.840	.842	.851	.851	.842	.843	.855	.852	.839	.845	.838	.836
Vis. Index	...	...	...	...	...	...	78	...	...	...	...	...	...	81
Vol. % Yield	93	86	84.2	81.6	88.5	93	76.4	78	93	47.5	47.2	26	12.2	25.1
Run No.	**55**	**50**	**58**	**54**	**51**	**64**	**99**	**42**	**43**	**48**	**40**	**41**	**44**	**47**
Kind of Propane	P	P	P	P	P	P	P	P1	P1	P1	P1	P1	P1	P1
Vol. Propane/Vol. Resid.	4.0	5.7	11.5	2.4	5.7	11.5	11.5	3.8	4.6	13.3	5.7	6.1	5.7	5.0
Deasphalting Temp. °F.	166	166	165	193	191	192	192	96	99	104	156	160	164	191
Deasphalting Press. Lb. Gauge	...	...	400	...	515	...	...	165	...	...	340	...	365	490
Vol. % Propane in: Upper Layer	88	91	94	91	94	96	..	80	86	93	87	..	89	93
Vol. % Propane in: Lower Layer	56	50	47	51	50	51	..	..	47	..	50	..	50	55
Deasphalted and Depropanized Upper Layer:														
Vis. at 210° F. Saybolt	107	107	109	82	81	82	82	206	207	209	150	138	141	94
Gravity °API	23.5	23.7	23.4	25.2	25.2	24.8	24.8	20.8	20.8	20.9	22.0	22.1	22.1	23.7
Color in 85% W. W.	2⅛ R	3½ R	5R	3¼ R	8¼ R	5⅞ R	10¾ R	¼ R	¼ R	⅜ R	¾ R	1R	¾ R	4R
Carbon Residue	...	...	1.9	...	7.4	...	...	...	...	...	...	...	...	...
Vis. Grav. Constant	.835	.835	.837	.830	.830	.832	.832	.847	.847	.846	.842	.843	.843	.838
Vis. Index	...	81	...	...	...	78	...	...	...	...	...	...	...	...
Vol. % Yield	37.7	51.5	59.6	6.3	25.5	34.4	39.4	90	89.5	86.1	74	67	68.7	35.3

P—Natural gas propane. Pl—Refinery propane (Containing approximately 80% C_3 and about 30% unsaturates).

s Improved by Propane-Acid Deasphalting*

effect is particularly striking, since the higher propane ratio means that a given volume of oil is contained in a greater volume of solution, and that therefore the color of the layer before depropanizing must be very much lighter when the oil concentration is lower. In other words, the colored material is very insoluble in propane, and is only kept in solution by the oil. It may also be noted that there is no close relation between color and viscosity.

It will be seen in Table I that the propane concentration in the lower layer is remarkably uniform at about 50% by volume. There is some trend toward lower propane concentrations at the lower temperatures.

The behavior of the yield curves in Fig. 2 can be readily explained in terms of the ordinary theory of a three component system of two phases. This is brought out by Wilson and Keith*; Fig. 8 and 9 in their paper are based on the data of Table I.

In addition to the single stage work, some countercurrent experiments were tried, and were shown to increase the yield of a given quality of oil, with the formation of a harder asphalt. As it was not desirable to go in this direction, the countercurrent test results were not used in the design of the commercial plant.

*Proc. Am. Pet. Inst. 15, III, 106 (1934).

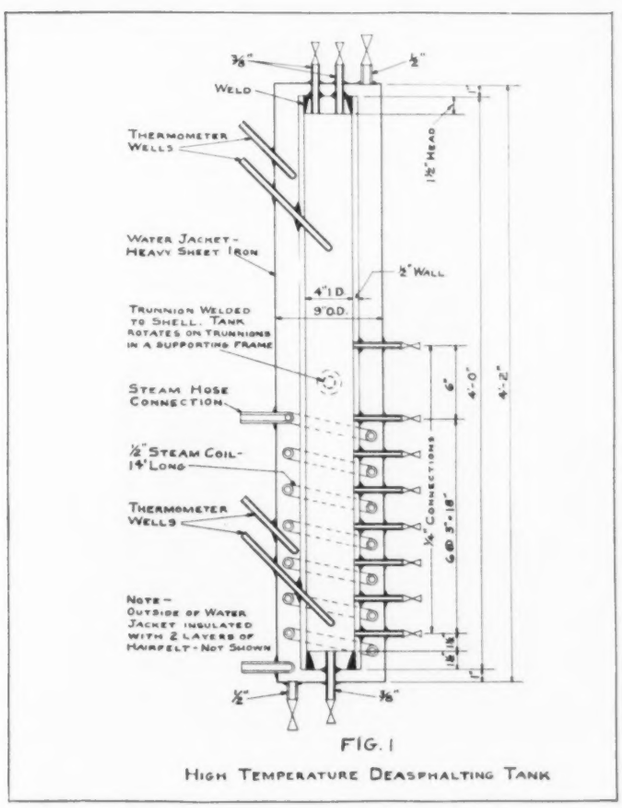

FIG. 1

HIGH TEMPERATURE DEASPHALTING TANK

Fig. 1. High temperature experimental deasphalting tank, used in Standard of Indiana's laboratory for studying propane deasphalting operations on heavy Mid-Continent residua

Laboratory Work on Acid Treating

The experimental equipment used in studying the effects of acid treating the deasphalted oils in propane solution was a steel autoclave of 1.5 gallon capacity equipped with a flanged top, a gauge glass, a motor driven stirrer operating through a stuffing box in the removable lid, and an acid reservoir with bottom draw and upper free space both manifolded into the autoclave through the lid. This equipment would handle satisfactorily one-third gallon of viscous oil in a four to one propane to oil solution. A bottom drawoff was provided for sludge removal, the treated oil being removed by propane pressure through a pipe extending through the lid to a point within the autoclave well above the sludge level.

The technique of operations was as follows. A known quantity of oil was weighed into the autoclave by difference from a container. The lid was then bolted into place, and the required volume of propane added from a pressure cylinder, cooling the autoclave and heating the cylinder as necessary.

The propane volume introduced was measured by calibrated gauge glass levels. The oil and propane were then put into solution in one another by stirring, the small amount of viscous oil in the sludge drawoff pipe being mixed in by inverting the autoclave one or more times. By laying the autoclave on its side, the solution was allowed to drain out of the gauge glass into the treating chamber, whereupon the gauge glass was valved off from the autoclave proper. The equipment was then immersed in a suitable bath for control of treating temperature. With the stirrer going, a measured quantity of acid, previously introduced into the acid chamber, was allowed to drop into the propane-oil solution. An agitating time of 10-20 minutes was allowed, followed by a settle of one to six hours. Sludge separation was always rapid.

In practice, treated oil was withdrawn through the overhead drawoff. This, of course, left a portion of the oil-propane solution in the autoclave. Yields were determined

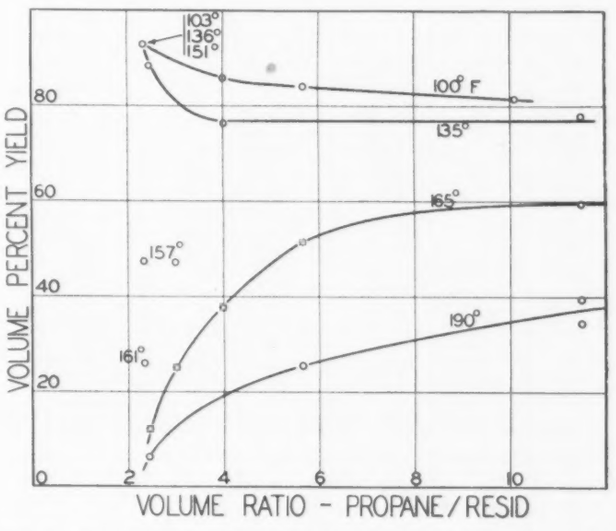

Fig. 2. Curves showing relationship between the propane/residuum ratio and per cent yields from heavy residua

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by drawing the sludge, introducing water into the autoclave and then drawing the remaining oil floating on the water surface. Only the first oil draw was used in studying properties. The treated oil, freed of propane, was reintroduced into the cleaned autoclave, the original propane to treated oil ratio regained by introduction of fresh propane, and the sour solution washed by introduction of excess 3% sodium hydroxide solution and stirring. Sour oil acidities are of the order of 1.00-1.25 mg. KOH per gram of viscous oil. The caustic wash was usually followed by similar water washes, but these do not seem to be required as no ash was found in the treated oils whether or not the caustic washes were followed by water washes.

Effect of Quality of Propane

Earlier treats in this study were made using refinery propane. These treats invariably led to poor results, giving, even with large acid ratios, dark oils requiring excessive clay for attainment of specification color. Cast was always poor, and high temperature contacting was found to be necessary for production of the desirable bloom. Table IV indicates the results to be obtained by treating in propane containing unsaturates. The stock used was a 228 vis. Deasphalted residuum obtained by deasphalting in propane a 300 vis. M. C. residuum.

A true color of 470-520 before percolation was required to give an average filter yield of 500-550 gallons per ton of clay.

The cast of all the above oils was satisfactory after contacting with 1.0 lb. acid-treated clay per gallon fol-

TABLE II

Deasphalting 546 Vis. at 210° Saybolt Mid-Continent Residuum in Natural Gas Propane.

Run No.	Resid. 80	Gravity 17.4° API 82	81	76	79	77	78
Volumes Propane Per Volume Resid.	3.0	4.2	10.1	4.2	11.5	3.0	11.5
Deasph. Temp., °F.	102	99	100	120	119	137	136
Deasph. and Depropanized Upper Layer Vis. at 210°F. Say.	280	233	201	203	185	187	165
Gravity, °API	19.8	21	21.4	21.7	21.9	21.9	22.6
Color in 85% Water White	¼ R	½ R—	1⅝ R	⅝ R	1⅞ R	⅝ R	1⅜ R
Vis. Grav. Constant	.850	.846	.842	.840	.840	.840	.836
Vol. % Yield	82.7	78	75	68	73.5	49	65

TABLE III

Deasphalting 86 Melting Point Mid-Continent Residuum in Plant Propane.

Run No.	M6	M1	M5	M4	M3	M2
Propane to Resid. Ratio— by Vol.	1.9:1	11.3	1.9:1	4.4:1	11.3:1	11.3:1
Deasphalting Temp., °F.	74	72	126	126	126	155
Deasph. Oil—Vis. at 210° F. Saybolt	...	...	534	420	452	...
Asphalt—M. P. °F.	...	168	91	125	163	125
Deasph. Oil—% Yield by Vol. (Approx.)	1.6	54	14	35.5	51	33.6

lowed by percolation but entirely unsatisfactory when finished to color by straight percolation. Experiments with mixed propane showed that as little as 10% plant propane in natural gas propane continued to lead to a stock of objectionable bluish green cast.

Effect of Propane Ratio

The effect of propane ratio during treating on yield and quality of finished oil was not studied in great detail. Treats were made almost entirely using 3.4 or 4.0 volumes of propane per volume deasphalted oil corresponding to 3.0 or 3.5 volumes propane to one of residuum in the deasphalting step.

Effect of Temperature and Acid Strength

Treating temperature was varied from 110°F. to 0°F. without noticeable effect on treating results. Acidity of treating acid was varied from 89% to 98% with progressive improvement of 91% and 93% acid over 89% as a color remover. Use of 98% acid, however, gave results substantially identical with 93% acid. Above 98% acid, increasing danger of sulphonation with subsequent washing difficulties might be expected, although this was not verified by test.

Treating yields, on deasphalted oil basis, of 86-87% for 0.25 lb. 93% H_2SO_4 per gallon, of 80-82% for 0.5 lb. acid, and of 76-78% for 0.75 lb. acid may be considered representative, with somewhat higher treating yields on

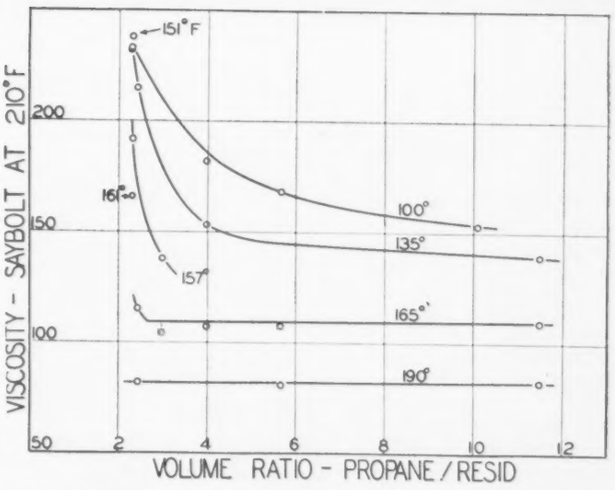

Fig. 3. Curves showing relationship between propane/residuum ratio and the viscosity of the finished bright or cylinder stocks

the more heavily deasphalted stocks, and somewhat lower treating yields on the more lightly deasphalted stocks. Table V shows a summary of typical experiments with various amounts of acid.

Choice of Operations for Commercial Plant

Because of the great fluidity of the propane, it was fairly certain that orifice mixing would be adequate and hence no mechanical mixers were installed. Also, because of the relatively low acid requirement per gallon of oil-propane mix, it was feared that small amounts of water in the mix might weaken the feed acid enough to reduce the efficiency of the operation. Accordingly a two-stage countercurrent acid treating step was installed. The sludge would then dry the oil so that the fresh acid would meet bone-dry oil. It was also hoped that this arrangement would give better efficiency in the use of acid, although no experiments were made on this point because of the expense involved. (Actually, the two-stage operation is very effective, the acid consumption being little more than half that predicted on the basis of the single-stage laboratory results).

In order to give flexibility to the plant, the asphalt settling drum was designed to withstand a pressure considerably above the vapor pressure of propane at 160°F. It was believed on the basis of more conventional treating processes that treating at temperatures much above 110°F. would be unsatisfactory. The two stages of acid treating were therefore designed so that part of the propane in the

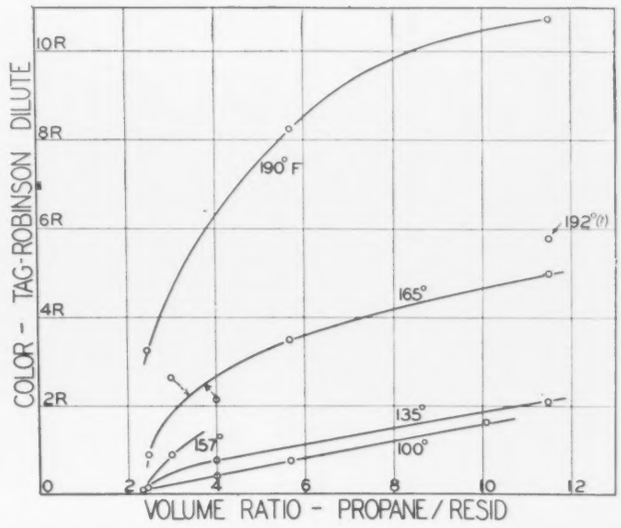

Fig. 4. Curves showing relationship between propane/residuum ratio and the color of the finished oil

TABLE IV

Acid Treating in Plant Propane.

Exp. No.	Ratio Plant Propane Oil	Lbs. Acid Per Gal. of Resid.	Treating Temp. °F.	Length of Sludge Settle	Sour Oil Treating Yield Vol. %	Contact Clay Lbs./Gal. Treated Oil	True Color of Viscous Oil After Claying	Filter Yield to No. 1 Bright Stock (Gal./Ton)
1	2	0.75	80-90	1	86	0.6	1550	...
						1.1	930	...
2	2	1.25	80-90	16	90	0.7	2230	...
						1.3	1450	...
3	2	1.50	80-90	1	84	1.0	780	270
4	2	3.00	80-90	1	89	0.7	4620	...
						1.3	2690	...
5	4	1.00	75	1	83	1.1	830	300

mix could be flashed off to reduce the temperature, before the sludge was settled out. This arrangement was never used, as deasphalting temperatures have not gone above 110°. The rise of temperature on acid treating has turned out to be too small to measure.

The greater part of the propane must of course be taken off at a pressure high enough to permit of condensing the vapors directly with the available cooling water. The remainder is stripped out at a lower pressure and must be recompressed. To keep down the initial expenditure, this part of the system was designed for a pressure high enough to permit the use of single-stage compressors. The increased stripping steam required was computed to be of little importance.

It was known from the laboratory work on acid treating that the acid sludge could not be handled without the addition of a light flux oil, but that flux oil, added before the propane was removed, would enable it to be handled easily. It was known that the simplest method of handling the asphalt involved the use of high-pressure steam (350 lb. or above). However, this was not available at the site, and to avoid installing a long line, fluxing with light oil was decided on, to make possible the use of 110 lb. steam.

The size of the settlers for asphalt, sludge, and caustic could not be computed with any accuracy. From some experiments in a continuous vertical settler 10 inches in diameter, it was known that an upward flow of 10 feet per minute led to considerable entrainment in the case of the asphalt. Horizontal settlers were considered to be the best type, and as constructed a vertical settling rate of only a few inches per minute is called for. The necessity for drawing vapors from the vessel led to the choice of vertical settlers for the sludge. In this case the batch experiments suggested that the settling was probably quite rapid. A larger diameter was provided in the case of the second settler.

Lead linings were provided in the sludge stripper and the sludge rundown tank where dilute acid would

TABLE V

Typical Results of Acid Treating

Treat No.	Viscosity of Resid.	Viscosity of Deasphalted Resid.	Amount (Lbs./Gal. Deasphalted Oil)	Acidity (% H_2SO_4)	Sour Oil Treating Yield (Vol. %)
6	300	228	1½	93	69.4
7	300	228	¾	93	72.8
38, A, 1	352	224	¾	93	75.8
38, A, 2	352	224	¾	93	77.9
45	352	220	¾	93	76.6
36	352	224	½	93	80.4
44	352	220	½	93	82
49	352	220	½	98	81.5
39	546	235	½	93	80.9
40	546	202	½	93	84.3
43	546	202	¼	93	86.4

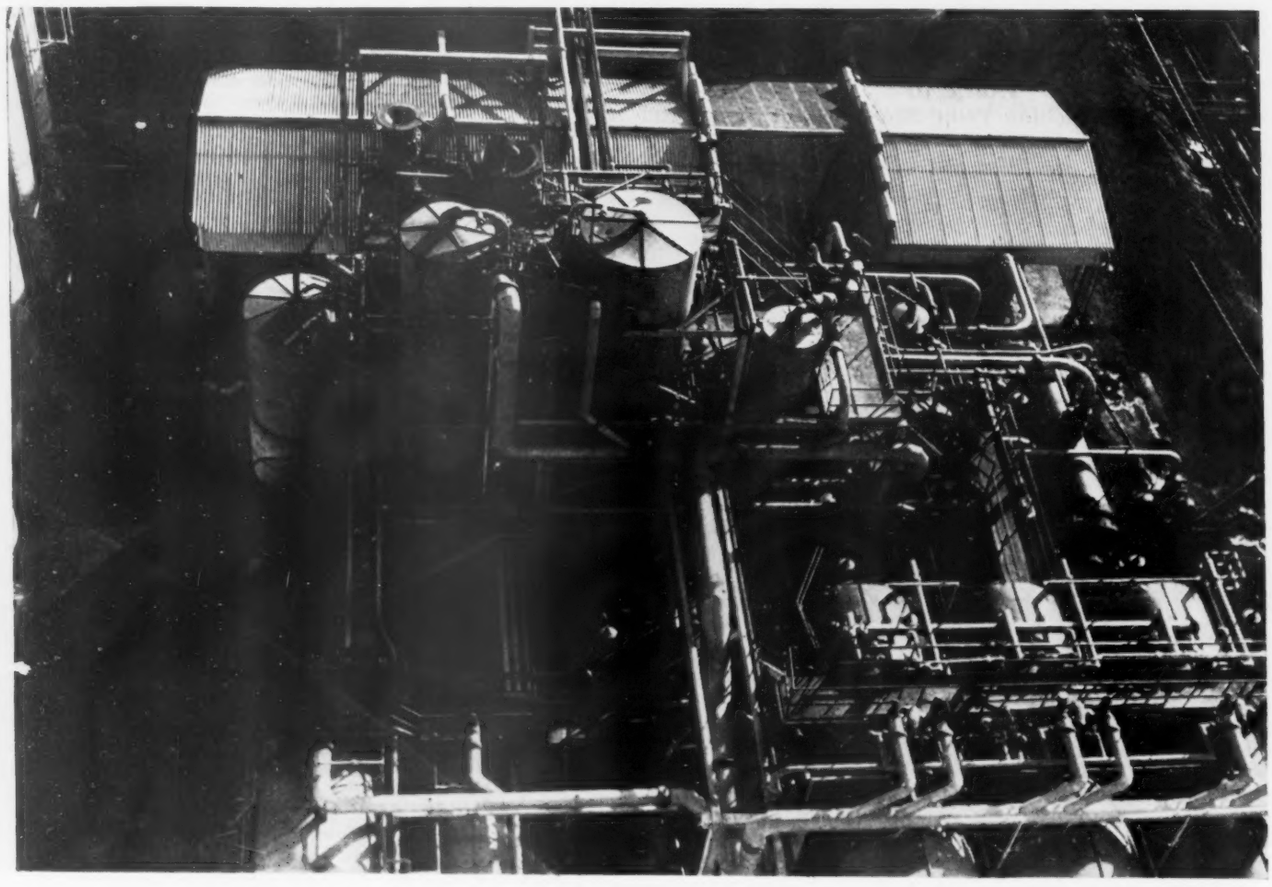

Fig. 5. Looking down on propane-acid refining unit, from top of 250-foot vapor vent stock

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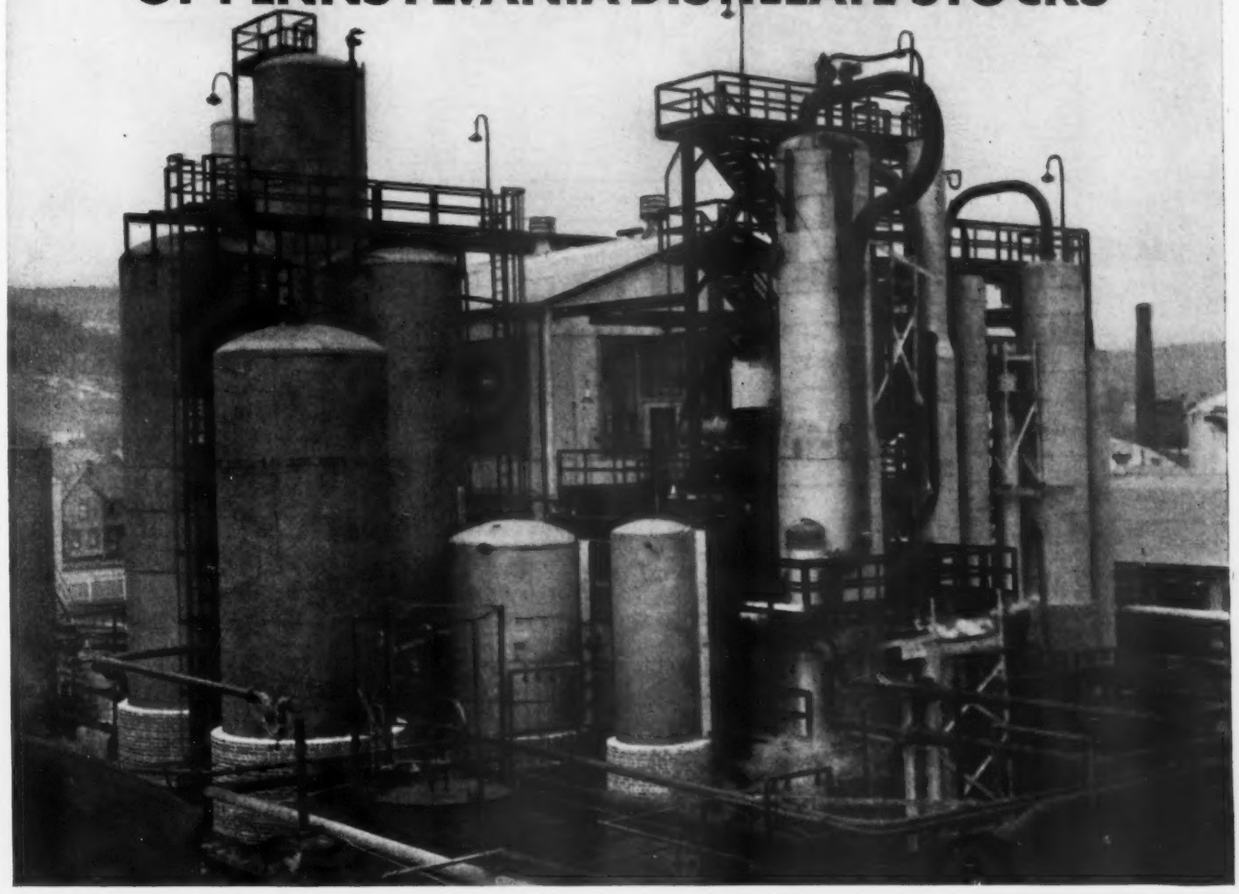

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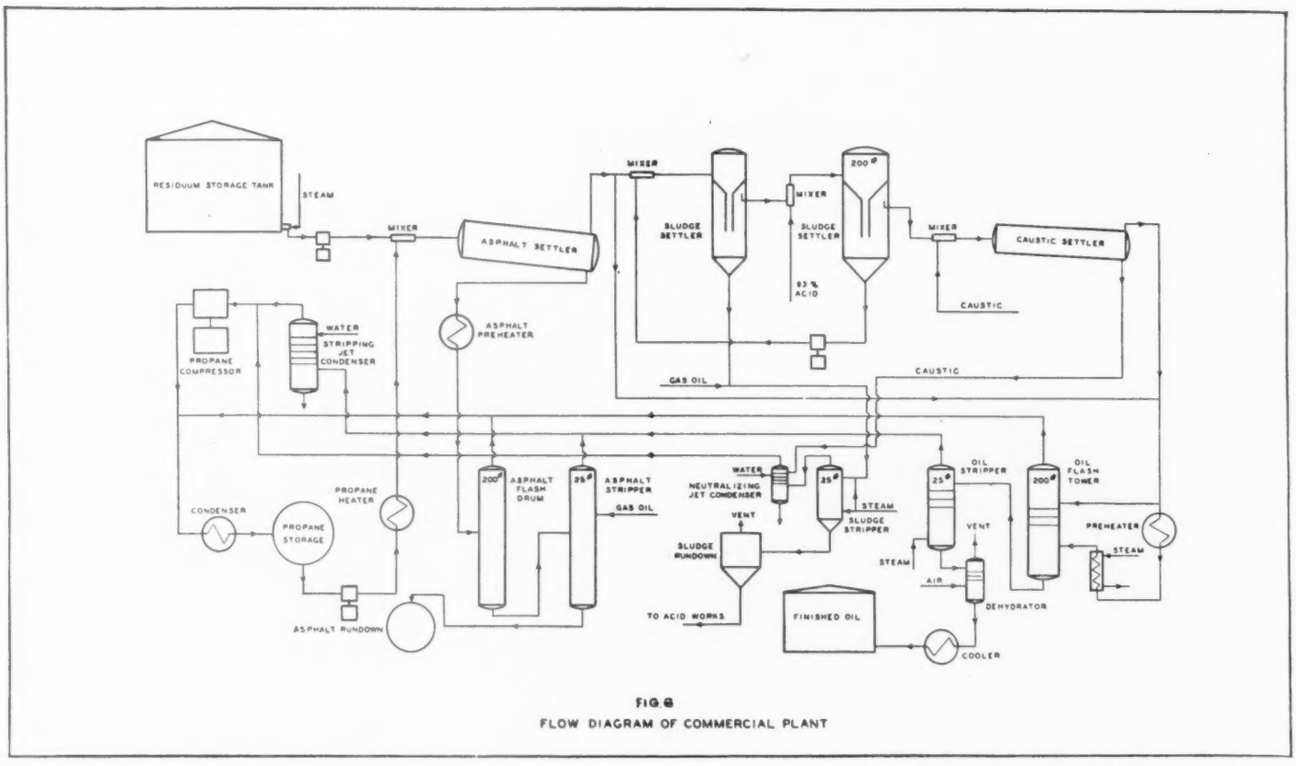


FIG. 6
FLOW DIAGRAM OF COMMERCIAL PLANT

Fig. 6. Flow diagram of commercial propane deasphalting, acid treating unit for heavy residual lubricating stocks

occur and in the first sludge settler in which weak acid might at times be expected. It was realized that considerable corrosion might occur in some other places, but it was believed that it would be better to make the equipment of ordinary steel and to provide for the insertion of a large number of corrosion strips rather than to go to more expensive materials at the start, since the points where corrosion might occur and the best materials to use were problematical. This program involved the prospect that certain portions of the equipment might have to be replaced, but it seemed probable that these would be only a small part of the plant. (The results of nearly two years experience are discussed in a later section; it should be mentioned, however, that the lead lining in the first sludge settler was found to be superfluous.)

Description of Plant

Fig. 6 gives a simplified flow diagram of the plant as it now operates.

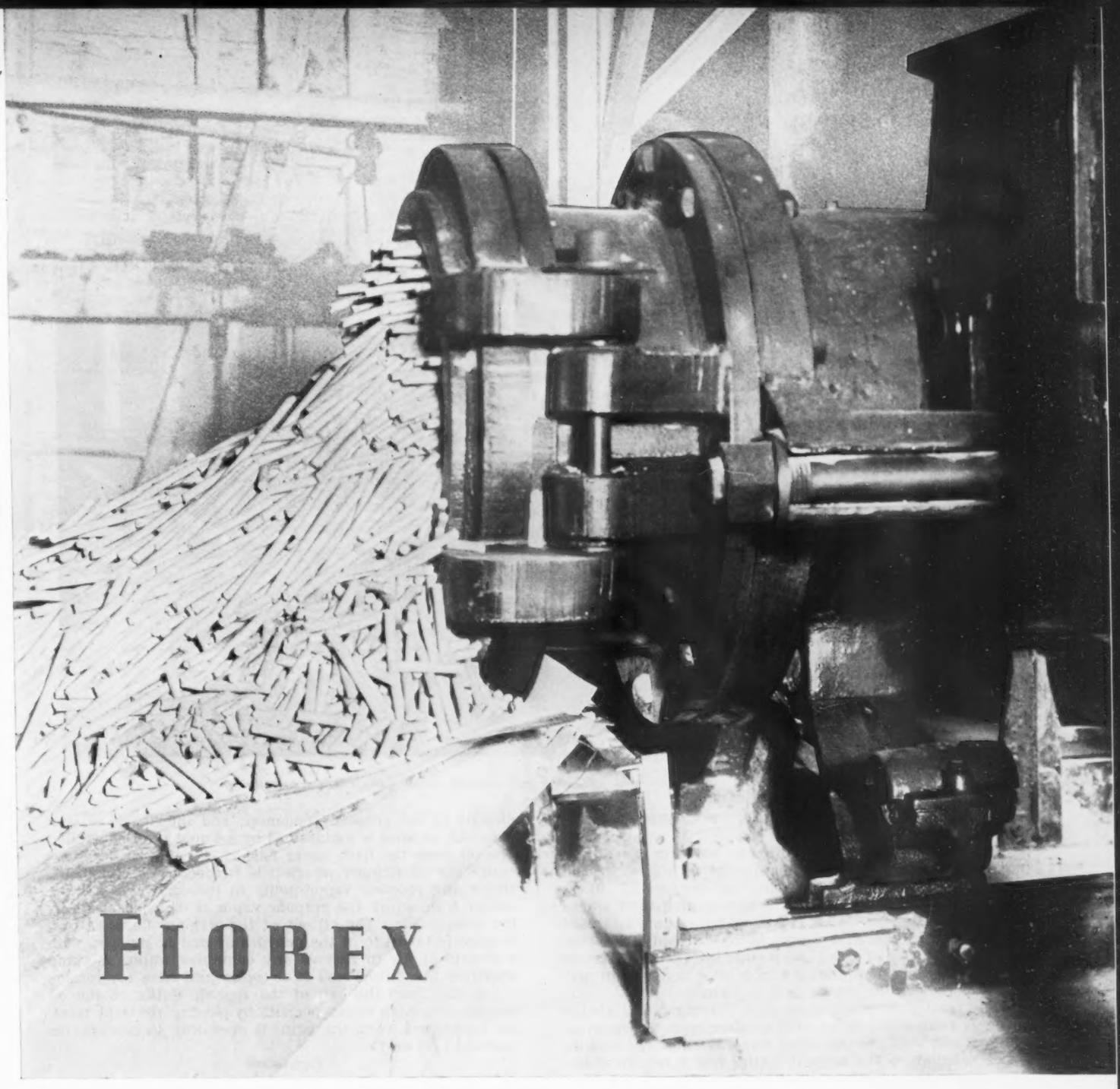
TABLE VI

Plant Data Deasphalting and Acid Treating. Charging 55,000 Gal. of Residuum per Day

Resid. Charged—Vis. at 210 Saybolt	400
Propane to Resid. Ratio—Vol.	3:1
Asphalt Settler—Pressure Lb. Gauge	390
Asphalt Settler—Temp. °F.	110
Sludge Settler No. 1—Pressure Lb. Gauge	220
Sludge Settler No. 1—Temp. °F.	107
Sludge Settler No. 2—Pressure Lb. Gauge	212
Sludge Settler No. 2—Temp. °F.	104
Caustic Settler—Pressure, Lb. Gauge	200
Caustic Settler—Temp. °F.	100
Oil Preheater Exit Temp. °F.	260
2nd Oil Heater Exit Temp. °F.	296
Oil Flash Tower Exit Vapor Temp. °F.	120
Oil Flash Tower Exit Oil Temp. °F.	285
Oil Flash Tower Exit Pressure—Lbs. Gauge	200
Oil Stripper Exit Oil Temp. °F.	270
Oil Stripper Pressure—Lbs. Gauge	25
Asphalt Preheater Exit Temp. °F.	315
Asphalt Flash Tower Exit Temp. °F.	300
Asphalt Flash Tower Pressure, Lbs. Gauge	200
Flux Oil to Asphalt Stripper Temp. °F.	200
Asphalt Stripper Exit Temp. °F.	240
Asphalt Stripper Pressure Lbs. Gauge	25
Sludge Stripper Exit Temp. °F.	235
Sludge Stripper Pressure Lbs. Gauge	25
Finished Oil—Vis. at 210 Saybolt	179
Finished Oil—Color single dilution—N.P.A.	5½
Finished Oil—Yield Vol. %	72.2
Asphalt without Flux—M.P. °F.	149
Asphalt without Flux—Yield Vol. %	13.7
Ratio of Flux to Asphalt by Vol.	1:1
Sludge without Flux—Yield Vol. % (by difference)	14.1
Ratio of Flux to Sludge by Vol.	0.8:1

The propane and residuum are pumped from storage through two orifice mixers in series to the asphalt settler, a drum 8 feet in diameter and 32 feet long with a slight tilt from the horizontal. The propane stream is spilt at the mixers, a portion entering each one. As the stream passes through the asphalt settler the asphalt settles to the bottom and is drawn off continuously by means of a liquid level controller. The asphalt stream passes through a live steam heater to the asphalt flash tower where the propane vapor passes out at the top to the propane condenser and from there back to storage. There are three propane storage drums of about 10,000 gallons capacity each. The asphalt is drawn off continuously at the bottom by means of a liquid level controller to the asphalt stripper, the pressure being reduced from 200 lb. per gal. to 25 lb. per gal. Hot gas oil is sprayed into the top of the asphalt stripper to flux the asphalt and prevent foaming. The vapors go overhead to the stripping jet condenser and from there to the compressor where they are compressed, put through the propane condenser and back to storage. The asphalt-gas oil mixture passes out the bottom and is pumped to storage.

The propane solution of deasphalted oil leaves the asphalt settler through a back pressure regulator which holds a pressure on the asphalt settler higher than the vapor pressure of the solution at the settling temperature. The stream is mixed with sludge from No. 2 sludge settler in an orifice mixer, and passes into No. 1 sludge settler where the spent sludge settles out. This settler is a vertical drum 6 feet in diameter with a separate upper compartment designed as a flash drum. A sludge level is maintained by means of a liquid level controller, the sludge passing out continuously at the bottom. The sludge is mixed with a stream of gas oil and as it enters the sludge stripper is mixed with a jet of live steam which decomposes it and vaporizes the propane. Additional stripping steam is introduced into the sludge stripper through a perforated coil placed below the liquid level. The steam and propane vapor go overhead to the neutralizing jet condenser where the steam is condensed and vapor freed of any sulfur dioxide by contact with water and caustic; the propane vapor is then picked by up the compressor, condensed, and run back to storage. The decomposed sludge goes to the sludge rundown tank from which



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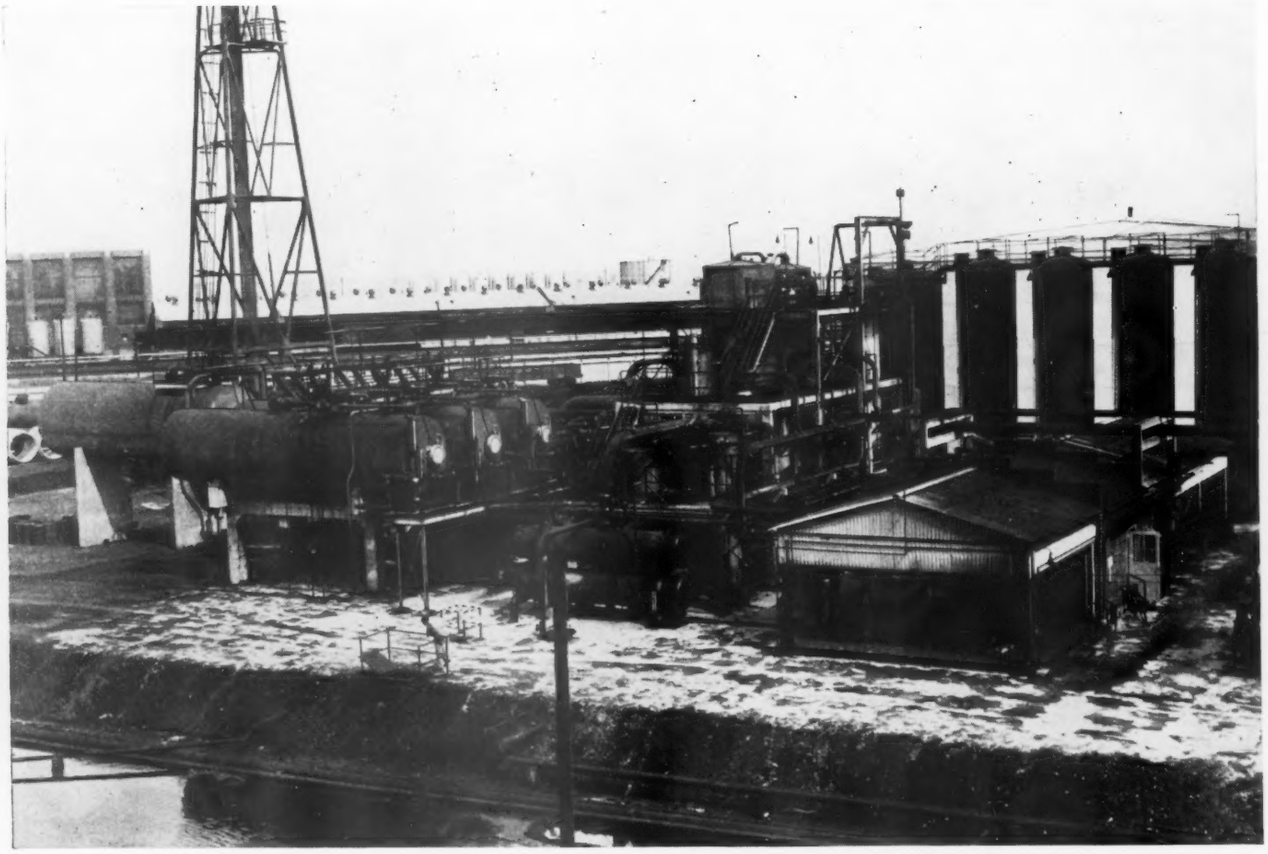

Fig. 7. General view of propane-acid unit, showing horizontal settling tanks and heat exchangers

it is periodically pumped to the acid works sludge separators.

The partially treated oil-propane solution leaves the first sludge settler and is further treated with fresh acid in an orifice mixer, the mixture entering the second sludge settler (similar to the first but 8 feet in diameter) where the sludge settles out and is picked up by a pump and used for treating in the first stage as has already been described. No sludge level is maintained in the second sludge settler the pump being run a little faster than necessary to remove the sludge as it is formed.

The treated oil-propane solution leaving No. 2 sludge settler is neutralized in an orifice mixer with a stream of dilute caustic and the combined streams enter the caustic settler (similar to the asphalt settler but 6 feet in diameter) where the caustic solution settles out and is drawn off continuously by means of a liquid level controller to the neutralizing jet condenser where it neutralizes the vapors from the sludge stripper.

The neutralized oil-propane leaving the caustic settler is split into two streams. Approximately two-thirds goes through an exhaust steam preheater and a live steam secondary heater in series, and then to the oil flash tower below the bubble trays. The other third of the stream goes directly to the flash tower above the trays and obtains the heat necessary to remove its propane by exchange with the vapor from below the trays. The vapors pass directly to the propane condenser, and then back to storage. An oil level is maintained by a liquid level controller. The oil from the flash tower flashed down to 25 lb. gauge enters the oil stripper where it is stripped with steam, the steam and propane vapor going to the stripping jet condenser from which the propane vapor is then picked up by the compressor. The oil out of the stripper flashes to atmospheric pressure in the dehydrator and is stripped with a stream of air to remove any contained water. A pump transfers the finished oil to a cooler and then to storage.

A line from the exit of the asphalt settler to the oil heaters and flash tower permits by-passing the acid treating equipment when the plant is operating to produce deasphalted oil only.

Corrosion

Corrosion strips of steel and of various metals were placed in more than a dozen locations throughout the unit. As was to be expected, corrosion of steel is very severe at the point where the steam and sludge come in contact, and in the sludge stripper, sludge rundown tank, and the line between them. Various brasses, aluminum bronze, and various copper-nickel alloys have been found to be satisfactory for this service; because of their mechanical properties especially in case of fire, the copper-nickel alloys have been preferred. The tee at the entrance to the sludge stripper is now of monel metal, as are the cocks and valves in the rundown line and the float in the sludge

TABLE VII

Utilities and Chemicals.

	Old Procedure	Present Procedure
Fuel Oil (gal.)	20	None
Steam (live) lbs.	2845	1040
Steam (exhaust) lbs.	395	Produce 365
Electric Power, KWH	12	..
Acid, lbs.	420	40
Caustic, lbs.	1.5	4.2

TABLE IX

By-Products

	Old Procedure	Present Procedure
Acid Sludge (gal.)	111	21
Asphalt (gal.)	..	20
Slop Oil (gal.)	1	..
Loss (gal.)	7.5	..

TABLE VIII

Oil Characteristics

	Grav. (°API)	Visc. (S.U. at 210° F.)	Flash (°F.)	Fire (°F.)	Pour (°F.)	Carbon Residue	Ash	Neut. No. (Mg.KOH/Gr.)	Cast	True Color
Residuum Charged	18	400	555	630	65	7.5	.09	.78	Black	17,000
Green Cast Filter Stk.	22.5	177	535	610	90	2.2	.09	.25	Green	540

stripper. That part of the rundown line which is under pressure is of lead-lined steel; the rest is brass.

At other points in the system the corrosion of steel has been found by a year's observation to be less than 0.005 inches per year, except in the vapor line from the sludge stripper and in the water line from the neutralizing jet condenser, where it is 0.02 to 0.03 inches. A corrosion allowance will take care of these points over a long period.

The lead lining in the sludge stripper originally installed was not bonded to the steel, but attached by straps in the customary way. While corrosion of the lining itself was negligible, it was found to be very difficult to keep tight mechanically, and the original stripper has been replaced by one in which the lead lining is bonded to the steel shell.

Vent Stack

All safety-valves in the plant are connected to a common manifold, which ends in a 10-foot diameter horizontal drum for collecting any liquid carried from the safety valves. From the top of the drum there rises a 250 foot steel stack (visible in one view of the plant). At the top of the stack three small pilot flames are constantly burning. To eliminate the possibility of an explosive mixture in the vent system, steam is bled in constantly and escapes at the top of the stack. The sewers are trapped and vent into the same system.

This system has worked quite well; one advantage is that warning of any considerable loss of propane is at once given by the flame at the stack. The system does, however, make it somewhat difficult to locate the source of any leakage.

Operating Conditions

For nearly a year the unit has been producing all the Whiting plant's demands for bright stocks and cylinder stocks. Typical operating conditions are given in Table VI

Utilities

Some idea of the saving effected by the new process may be obtained from the following table, based on 100 gallons of unpercolated wax-bearing green cast stock.

Products

The characteristics of the residuum charged into the plant and the green cast wax-bearing filter stock produced are shown in Table VIII. On dewaxing and percolation a yield of 440 gallons of 7-8 N. P. A. color green cast bright stock is obtained per ton of average grade Attapulgus clay.

The various products produced from stock treated in the new plant are in many cases indistinguishable from those produced by the old process; in certain specifications the new products are somewhat better.

By-products and losses per 100 gallons of filter stock are shown in Table IX.

Conclusion

The production of bright stocks and cylinder stocks by deasphalting and acid treating in propane solution has been carried out entirely successfully on a large commercial scale. The process constitutes a major advance over old procedures for producing this type of material.

New Production Analyzed

Petroleum from the Ten Section field and the Greeley field in Kern county, California, discovered during 1936, has been found to be a wax-bearing intermediate-base oil by the Bureau of Mines. The oil is similar to oils of the same classification produced in the Mid-Continent fields such as the Seminole field of Oklahoma and some oil fields of Kansas.

The Gravity of samples is approximately 37° A.P.I. The sulfur content of 0.28 to 0.37 per cent is lower than that of most California crude. Total gasoline and naphtha content is about 25 per cent.

The complete analyses of samples from both fields is available from the bureau.

Fig. 8. Distant view of the same plant, showing the 250-foot vapor vent tank, at the top of which propane vapors are burned to avoid danger

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Fractionating Columns, and Packings For Them*

By Dr. D. F. STEDMAN[1]

Sheets of wire gauze, perforated and shaped as shown in the accompanying article, show a remarkable efficiency as column packings for laboratory purposes. This article illustrates vapor and liquid paths through packing, and how efficiency of fractionation is obtained with packings of the types discussed. A method for calibrating the efficiency of fractionating columns is shown.

IN A fractionating column it is always desired to accomplish a particular separation at a minimum of expenditure, both in time and heat requirements. Now if the column used has an infinite number of plates there is a certain limiting value for both of these figures and the reflux ratio for such a column is an irreducible or critical value, below which it is not possible to accomplish the particular separation by distillation. In any practical case the more efficient the column the closer this minimum may be approached, with resulting direct economies in both time and heat.

As well as this effect there are a large number of mixtures, the separation of which is very desirable, and about which adequate data are available, but which require such enormous columns that their construction is not feasible. It is also in just these cases that any actual column is likely to deviate most seriously from the "relatively infinite" owing to the expense of constructing a really adequate plant and therefore, these also require the expenditure of enormous and unnecessary amounts of heat.

In both of these directions the columns to be described make considerable improvement possible.

In view of the extended use of bubble columns and the impetus of commercial use under a wide variety of direction, it seems most unlikely that major improvement is possible in this type of column. They are necessarily essentially similar, which restricts the scope of possible changes, and having once mixed the vapor and liquid, time, which in this case means vertical height, must be allowed for their separation at each plate. Thus any attempt to increase their height efficiency by increased contact between the phases implies a finer state of subdivision of the liquid and consequently requires the provision of more time for the subsequent separation of the phases. This can be provided by either decreasing vapor speeds or increasing column heights, but both of these are the opposite of what it is desired to accomplish, and there is evidently an element of compromise in the balance between plate efficiency, throughput and vertical height.

However, as plate efficiencies are now from 50 to 80%, depending on the use of the apparatus, it is evident that great improvement is hardly possible, and that the search for higher efficiency must look to methods of liquid-vapor contact, which do not involve the dispersion of either phase. In effect this gives a packed column, with film contact as the only alternative.

Now, in such apparatus the possibilities are also relatively limited and apart from using moving elements, simply consist of (a) the shaping and distribution of the packing elements and (b) the choice of material to construct them, and preliminary experiments showed that rather fine mesh gauze had much to recommend it in both respects, it can be formed into practically any shape; has a fairly high capillarity which helps to distribute the

* Presented before American Institute of Chemical Engineers, Toronto Meeting, 1937.

[1] Division of Chemistry, National Research Council, Ottawa, Canada.

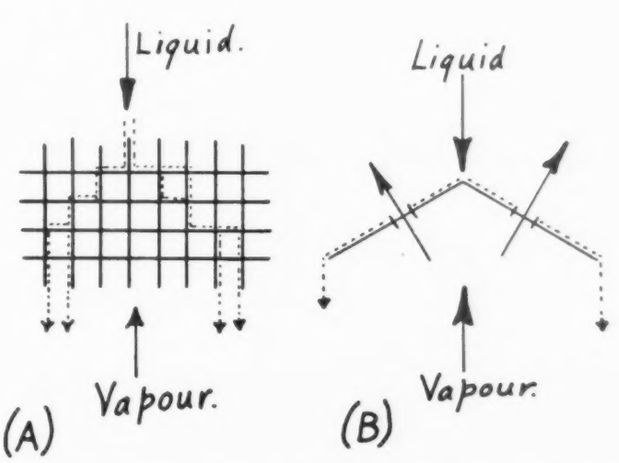


Fig. 1. (A) Diagram illustrating the paths of vapor and liquid in a coarse mesh packing of gauze arranged vertically; poor contact between the two phases is provided

(B) Good contact between vapor and liquid is obtained when packing is arranged as shown in this figure

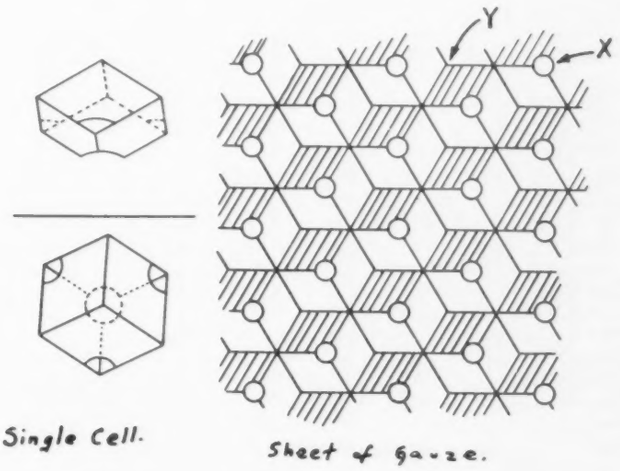


Fig. 2 (A) Diagrammatic representation of a single element to make use of the principle shown in Fig. 1 (B)

(B) Pattern of gauze stamped and perforated to utilize principle illustrated in (A)

liquid; and as the liquid passes over the material, it is constantly mixed by the woven structure.

The shape of the parts is, however, very important, and in Fig. 1 the type of effect which is most undesirable is, illustrated diagramatically in (A) which represents a fairly coarse mesh gauze in a vertical plane. A jet of vapor is illustrated opposing the liquid stream and causing it to divide and avoid the vapor as much as possible. This is, of course, an idealized diagram, but in most packings the liquid path is largely governed by the impact of the vapor. It will be seen that this action is cumulative; once the vapor has blown the liquid elsewhere a less obstructed path is provided for the vapor and the final criterion of stability is that both phases avoid one another as much as possible, which is quite obviously undesirable in a fractionating column.

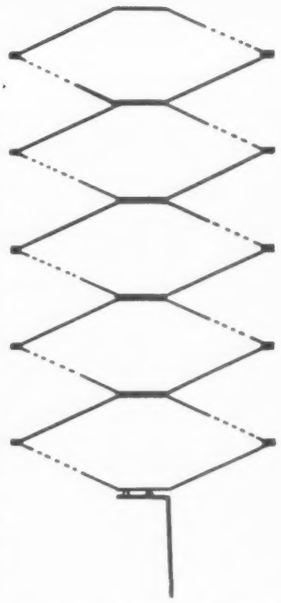


Fig. 3. 1-inch conical packing for fractionating column, a series of gauze discs pressed into truncated cones and welded together as shown

In Fig. 1B, however, is illustrated a means of producing the same flow pattern as in a, but with the mutual interactions removed. This diagram is intended to represent a vertical section through an inverted V-shaped structure, provided with a vapor hole on both sides. In this arrangement both phases have a definite path provided, and the distribution of each is not affected by the other phase. Such a structure it will be seen maintains the micro-distribution of the liquid at this particular point in the packing without reference to the distribution of the vapor at this point, but it also has another property which is actually even more important, in that the micro-distribution of the liquid at this particular point is not affected by the amount of vapor.

Thus, with "A" the ultimate effect is the complete segregation of both phases, but with "B" no matter how much vapor is passing upwards at this point, or what fraction passes through each of the two vapor passages, the primary subdivision of the liquid, at the apex of the V, is not affected, and consequently there is no mechanism by which channelling can be initiated.

In Fig. 2 A is shown a plan and elevation of a single cellular element shaped to make use of the principle of Fig. 1B. It will be seen that it is simply a cubical or rhomboidal box standing vertically on one corner. The lowest corner is truncated for entrance of vapor, and exits are provided at the other three lowest corners. Thus liquid poured onto the apex of the cell will be divided into three streams, one on each face, and the rising vapor will be subdivided similarly, each process being independent of the motions of the other phase.

Cells of this type might appear rather complex to use as column packing, but they are actually produced in a very simple manner. Sheets of gauze are perforated with a series of holes at equidistant spacings and are then stamped into a pyramidal pattern. This pattern is indicated in Fig. 2B, where the point (Y) is intended as a raised triangular pyramid, and each hole (X) is at the bottom of a pyramidal indentation. These sheets are then stacked together, placing the next sheet in the same orientation above that indicated in the figure but with a lateral shift, placing point Y over point X. The sheets are then spot-welded into position and the process repeated, building up a continuous lattice of cellular elements exactly similar to Fig. 2A.

No diagram of the completed structure is given as it is almost impossible to make such a diagram in an illuminating manner and the path taken by the liquid and vapor is perhaps best seen by considering the passage through each element. It will be seen that the sheet illustrated touches the next higher sheet along the lines forming the hexagons round each perforation and the next lower sheet along the three lines radiating from each hole.

If the pattern is followed out it will be seen that each cell is fed with vapor from three other lower cells, and that after passing through this cell it is again passed on equally to three higher cells, having, however, only ascended one-third of the vertical height of a cell in doing so. It will also be seen that the contact lines between the sheets each receive liquid from two gauze surfaces, and this liquid in passing downwards is again divided over two other surfaces. Thus both phases are repeatedly subdivided and recombined in a regular manner throughout the packing which maintains uniformity in the bulk distribution of the phases, and prevents the cumulative building up of any small irregularities in composition from point to point at any level in the packing.

This type of packing can be made in any size as the wall does not contribute to the control of flow of either phase, but for laboratory purposes an even more effective type of packing has been developed. This is illustrated in Fig. 3 and consists of a series of gauze discs pressed into truncated cones and welded alternately base to base, and edge to edge. Each disc has a vapor perforation at one side as indicated by the dotted line and the vapor after passing through each cell passes between the containing tube and the gauze around both sides of the axis before passing to the next cell.

It will be seen that the liquid is alternately brought together at the base of each cone and spread in a film over each disc, this action preventing any portions of liquid differing in composition from the remainder. The vapor is also treated somewhat similarly in that it passes in a single turbulent stream through each cell, and then divides to two streams, passing behind and in front of the packing. In this case, mixing is somewhat less important, as each phase passes through the packing in practically one stream.

This type is definitely limited in capacity as the containing tube helps to control the vapor flow and the pattern cannot, therefore, be repeated in a horizontal direction. As at present made in 1-inch circular tubes, this type has a capacity of about 20 cc. of reflux per min., while the pattern described before, made in ⅜-inch cells, has a capacity of 57.5 cc. per min. per sq. in. of section, in both cases using n-hexane at total reflux. At lower reflux values the capacity is considerably higher.

Calibration of This Packing

Many attempts were made to calibrate columns two or three feet long but this was ultimately abandoned as the results were often very misleading, and it has been found most satisfactory to calibrate quite short lengths, of not more than five theoretical plates. For this purpose a mixture of very highly purified n- and cyclo-hexanes is used containing about 25% of the former. This is distilled at total reflux till equilibrium is established and a small sample taken of the product which after analysis is returned to the still, repeating the process at a series of distillation speeds till the column blocks. The packing is then removed and the process repeated. Care is taken that the product does not become higher than about 80% n-hexane and using an average fractionation factor of

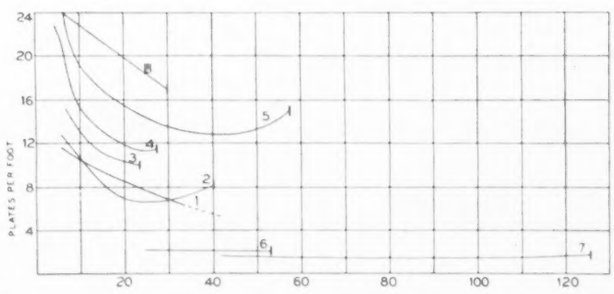
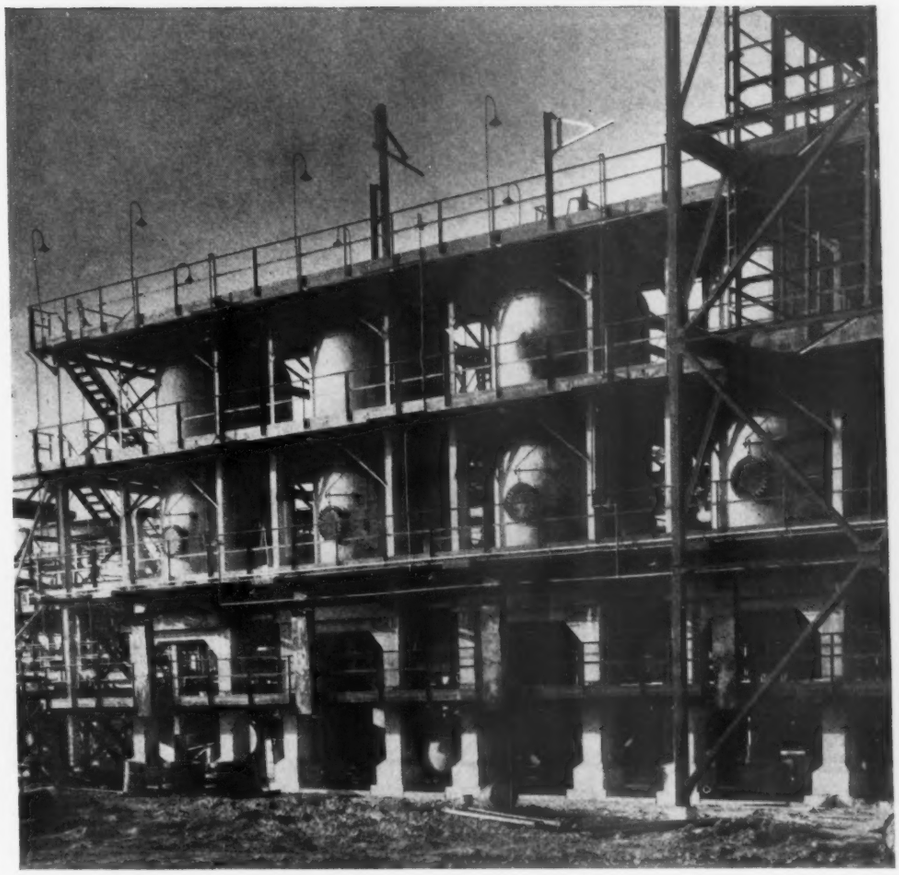


Fig. 4. Results of calibrating a column with pure liquid mixtures (25% n-hexane in cyclohexane), in terms of theoretical plates per foot of height against cc. of hexane distilled per minute per square inch of column section. Fig. 5. Curves showing the amount of holdup in a column, using benzene, showing the comparative amounts of liquid tie-up in different types of columns



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1.433, the effectiveness of both the packed and empty stills is calculated, subtracting the latter from the former to get the net effect of the packing.

The result is then expressed as theoretical plates per foot of height against cc. of hexane distilled per min. per sq. in. of section of the column and Fig. 4 gives a plot of these results for a number of packings tested.

The patterns used in these packings are:

1. Horizontal prismatic cells, of ¼" square section, as these are not as effective they have not been described in detail.

2. The same as 1, but 0.18" square cells.

3. 75° cones, and discs in 1" tube.

4. "Hexagonal" pattern of Fig. 2, 7/16" cells indented to 30° angle.

5. As 4, ⅜" cells, indented to give cubical cells.

6. As 5, 1½" cells, 7/16" perforations.

7. As 5, 1½" cells, 13/16" perforations.

8. Conical pattern of Fig. 3, in 1" circular tube.

The short vertical line indicates in each case the limiting speed at the blocking point, although No. 1 was not carried to the blocking point.

Another important item in the use of fractionating columns is the liquid tie-up. This is given in Fig. 5 and is measured by running benzene through the packing at a definite speed for a short time, interrupting the streams entering and leaving the column simultaneously, and weighing the entire column; the process being repeated at a series of speeds. It will be seen that a dynamic hold-up for cold liquid is obtained, which, for low vapor speeds, is naturally considerably higher than the amount of hot liquid retained. In Fig. 4 this applies to the portion of the curves where the efficiency is decreasing with increasing vapor velocity. At still higher vapor velocities, i.e., beyond the minimum of the curves the tie-up is gradually increasing, but only very slightly, till just before the blocking point, when it increases rather rapidly.

The reasons for adopting various of these columns for special purposes is evident. Thus No. 8 gives the highest efficiency and the lowest tie-up, and although of limited capacity, it is adequate for general laboratory work, where its high effectiveness gives extraordinarily sharp separations. No. 5 gives nearly as great height effectiveness, gives much higher capacity per sq. in. of section, and may be made in any size, and while its liquid tie-up is greater for larger scale work, this is often of little importance, and is quite low in comparison with standard packings in any case. While No. 7 requires only 1/5 as much gauze per cu. ft. of packing, and although its height effectiveness is not quite two plates per ft. it allows distillation at very high speeds and has a very low liquid tie-up.

Comparison With Other Columns

The following table gives a rough comparison of these columns with others at present in use. In general, columns show a very wide range of properties, but these figures represent about the type of results usually available, using the same units as Figs. 4 and 5.

TABLE 1

Comparison of Different Types of Columns.

Type of Column	Plates per foot	Liquid tie-up	Capacity
Small lab. columns	up to 4	50	30
"Fine chemical" commercial columns	.75	45	35
Crude oil columns	.3	40	100
No. 8	18.	4	30
No. 7	1.8	6	125

These figures do not, of course, pretend to cover all types, but the contrast in height effectiveness is very evident, and especially their utility for batch distillation where liquid tieup is very important. It might perhaps also be noted that comparison is made with the latest types of standard equipment, while this gauze packing is a new development which further investigation will undoubtedly improve.

Engineering Congress Transactions Make Five Books

LONDON, Aug. 1. — Publication of the Transactions of the Chemical Engineering Congress of the World Power Conference is announced by the office of the international secretary. The record of the congress is included in five volumes comprising the papers presented and the discussions which took place.

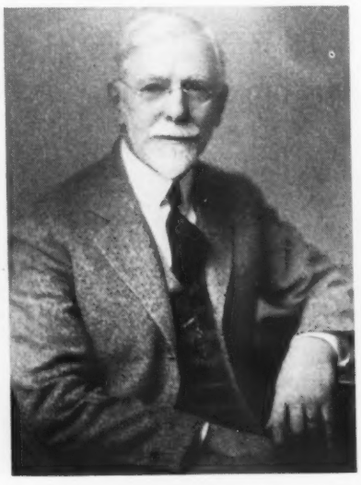
Subjects treated are divided into 12 sections. Volume I covers corrosion-resistant iron and steels, refractories, rubber, plastics, stoneware and other materials and metals used in construction of chemical plant. Volume II includes separation, size reduction, grading and mixing, electrolysis and electrical applications. Destructive distillation, treatment and disposal of effluents and waste materials, lubrication, high-pressure reactions, high vacua and heat exchange are dealt with in Volume III. Volume IV is devoted to the education and training of the chemical engineer, administration, safety and welfare, recent trends of development in water purification, sulfuric acid, phosphatic fertilizers, and other subjects. Each section is followed by a general report on the chief points raised in the papers. An extensive index is provided in Volume V.

Publication price is 12 pounds. A detailed prospectus can be obtained from the publishers, Messrs. Percy Lund, Humphries & Co., Ltd., 12, Bedford Square, London, W.C.1.

Oil Pioneer Honored

NEW YORK, Aug. 23.—Florus R. Baxter, pioneer in the development of the oil industry and member of the Petroleum War Service Board during the World War, has been appointed honorary chairman of the 94th meeting of the American Chemical Society, which will be held in Rochester, N. Y., Sept. 6-10.

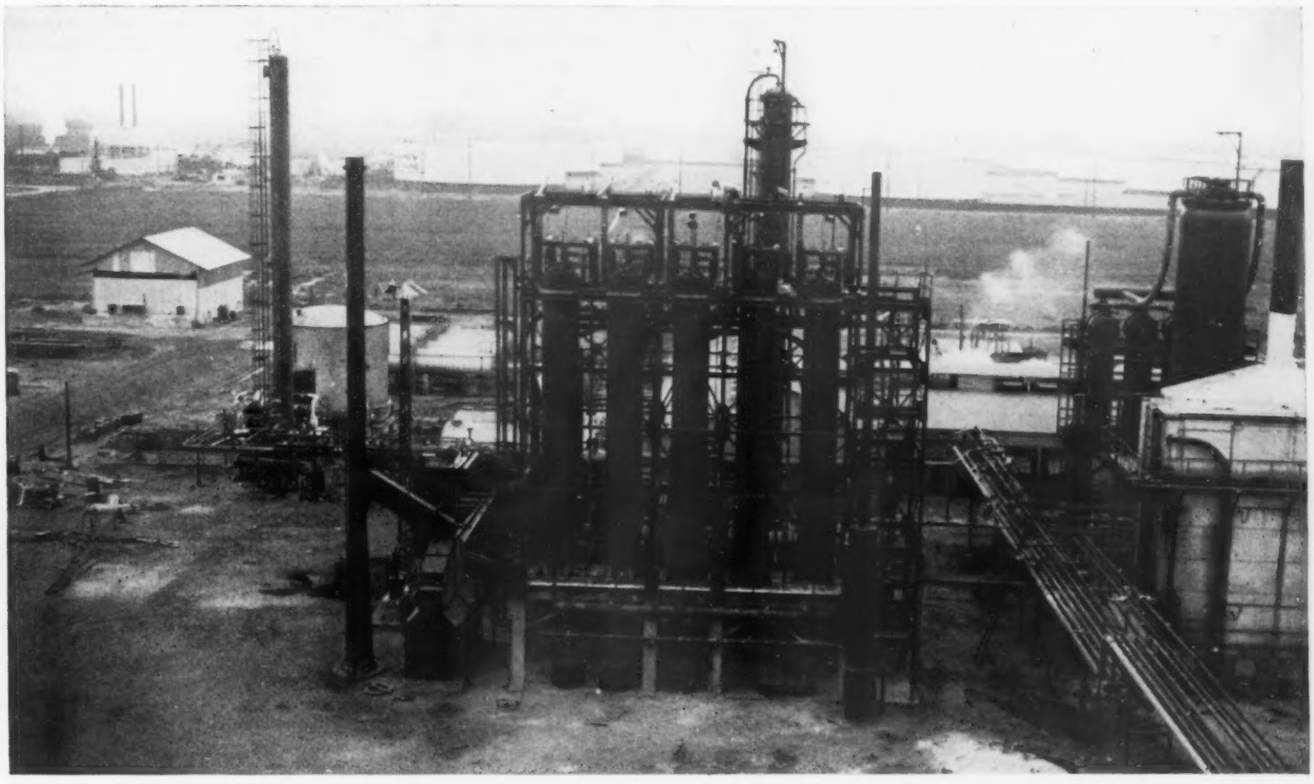
For 51 years he was in the service of the Vacuum Oil Co. As head of the company's laboratory during the greater part of this period, he was active in bringing order into the production of industrial lubricants and transformer oils. With the late Frank A. Roda he did much of the earlier work in the separation of amorphous paraffin from filtered cylinder oils.



Florus R. Baxter

Mr. Baxter, now 80 years old, retired in 1932, the year following the formation of the Socony-Vacuum Oil Co. His public service included also a study of foreign aircraft manufacturing problems for the government.

Fig. 1. Workmen on top of the five-tower catalytic polymerization plant, soon to be put in operation by Wilshire Oil Co., are putting on the final touches. This view shows the polymerization unit in its relation to the new hydrogen sulfide removal plant, which is to the left and can be identified by its 75-foot absorber



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Wilshire Starting Polymerization Unit And H_2S Removal Plant

By J. N. WESTSMITH
N. P. N. Staff Writer

WILSHIRE OIL CO., leading independent on the west coast, will start early in August to market a new motor fuel through its California dealer outlets. Under the trade name "Polly", which lends its admirably to much in color and description by way of advertising, this gasoline will be the result of completion by the company of a new catalytic polymerization plant at its Norwalk refinery.

With a daily throughput capacity of 2,500,000 cubic feet of stabilizer gas from the comparatively new two-coil Dubbs cracking unit, this latest refining addition will yield the company approximately 12,000 gallons of polymer a day. The octane number of this product will be about 82, with a blending value much above that.

The high octane blending stock will be used to raise the anti-knock properties of the company's standard grade gasoline which, by the use of cracked fractions, normally has a 69 octane number. Wilshire sells no leaded gasoline.

Operations, when the new plant is completed, will call for the 12,000 gallons of polymer yield to be blended in the ratio of 1 to 2 to give a total production of about 40,000 gallons of gasoline a day having a 75 octane number. The output of this high test gasoline will be about 1,200,000 gallons on a monthly basis.

Total charge of topped crude to the cracking plant is approximately 10,500 barrels a day. Tail gases from the stabilizer will yield in excess of the 2,500,000 cubic feet of charge needed for the polymerization unit, of which 35% by volume is converted to polymer gasoline. This net yield of approximately 300 barrels — 12,000 gallons — of polymer represents an additional return of nearly 3% on the original charge to the cracking unit.

Wilshire's cracking plant, as it has been operated, produces a gasoline of about 9 pounds Reid vapor pres-

● Catalytic (UOP) polymer gasoline with a straight octane rating of 82, will be produced from Wilshire's refinery still gases, and will be blended about 1:2 with refinery gasoline to raise the rating of the latter from about 69 to 75. A new "wrinkle" is used in this plant for the first time, to increase the stabilizer gas output.

Another new Shell Development Co. process is used to remove H_2S from the charge gas before polymerization uses tri-potassium phosphate as the reducing agent.

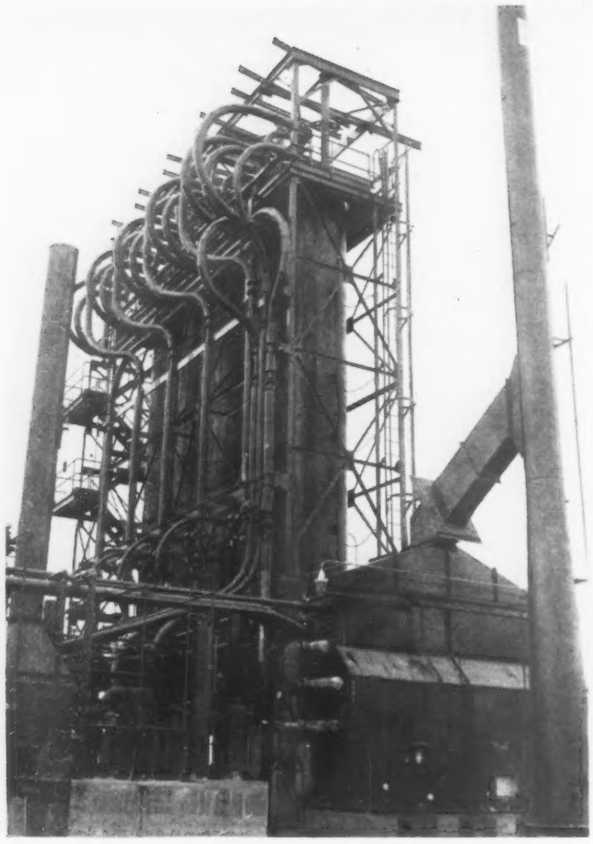

Fig. 2. This picture was taken at an angle—the stack on the flue gas heater at the left is not about to fall over. The intricate piping is necessary to permit any three consecutive towers, of the five available, to be used in series in processing gases from the cracking plant. The tall stack to the right is part of the polymerization plant heater in which temperature of the gases is raised to about 450° F.

sure. It is estimated that the polymerization unit will produce a 10-pound vapor pressure product.

It is expected this polymer yield will be increased somewhat by stabilizing the cracked gasoline to a lower vapor pressure, resulting in the addition of a butane-butylene fraction from the gasoline to the feed to the polymerization unit and, thereby increase the quantity of polymer gasoline.

In this type of operation a larger quantity of butane must be retained with the polymer to make up for the deficiency in the cracked gasoline. That is, the polymer must be of sufficiently high vapor pressure so that the blend with the low vapor pressure cracked gasoline will meet vapor pressure specifications for the blend. The polymerization unit was designed with sufficient flexibility to permit this type of operation.

As produced, the polymer will be of about 15 color and about 400 e.p. When used in small percentages in dyed gasolines, it may be blended directly without further treatment. However Wilshire will blend the polymer with the treated cracked gasoline before rerunning.

Although the octane number of the polymer gasoline when tested alone is between 80 and 82 by the Motor Method, the product is highly efficient in raising the anti-knock properties of other gasolines. The product from this plant is expected to have a blending octane number of about 90-95 and higher when mixed in the indicated proportions.

The estimated utility requirements for the new polymerization plant are:

	Maximum	Average
Water, GPM	451	417
Steam @ 150 lbs., lbs. per hr.	940	803
Electricity, KW	61	29
Fuel, B.t.u. per hr.	8,080,000	6,000,000
Catalyst consumption, lbs. per day		230

The difference between maximum and average figures is due to the fact that reactivation equipment will operate about 50% of the time.

The polymerization plant was built on the premise that the most satisfactory method of operation at this refinery was to process only gas from the cracking plant stabilizer. This gas is available at a pressure sufficient to permit direct processing without further compression.

At a future date compressor facilities may be added to increase the quantity of gas available to the polymerization plant. The present arrangement, however, takes from the stabilizer the major portion of the gas fractions useful from a polymerization standpoint, with only small changes to the exsiting absorber.

These changes include by-passing the stabilizer gas from the absorber and the cooling of the lean absorption oil to a lower temperature than in former practice. This plant represents the first application of a new wrinkle to obtain a greater output of stabilizer gas.

The greater efficiency is accomplished by setting up a recycle of stabilizer gasoline through the secondary tower, from which the stabilizer charge is taken, and through the stabilizer itself. By this operation, the charge to the stabilizer and consequently the output of stabilizer gas is appreciably increased.

It is still thought too early to predict just how much the charge of suitable stabilizer gas will be boosted, but a gain of 50% to 75% is indicated as not impossible.

To be run in connection with the polymerization plant, Wilshire has also built a treating plant for the removal of hydrogen sulfide from the stabilized gas before it goes to the furnace and catalytic towers.

This unit uses tri-potassium phosphate solution as a reducing agent. It is designed to give a sulfur free polymer gasoline. The gas to be processed is substantially a pure hydrocarbon containing about 5% hydrogen sulfide.

A fractional analysis of the stabilizer gas gathered from the Dubbs reflux accumulator shows the following:

	% By Volume
Specific gravity	1.3
Non-condensables	4.0
Ethene	2.6
Ethane	10.2
Propene	14.2
Propane	34.4
Iso-butene	5.4
N-Butene	12.1
Butane	16.5
Pentane and heavier	0.6
Higher Olefin content	31.7

The hydrogen sulfide is included in the "non-condens-

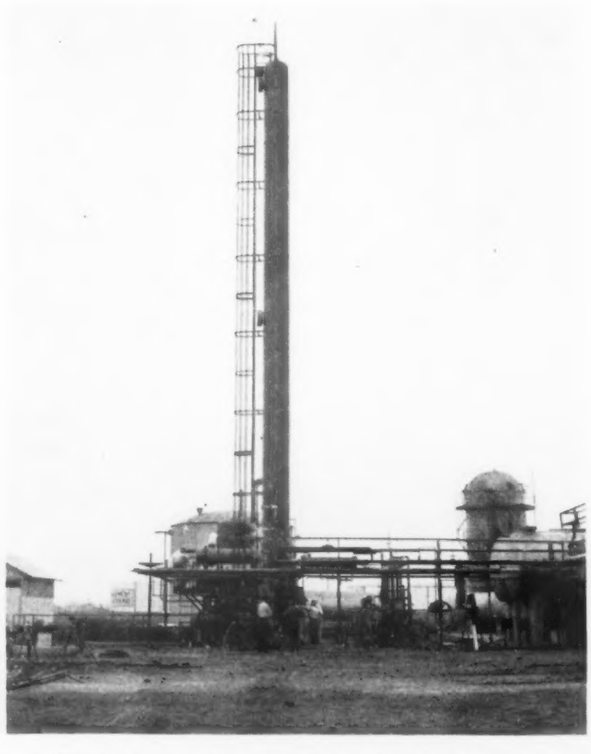

Fig. 3. The hydrogen sulfide removal plant has just been started on a trial run. Tri-potassium phosphate, used in this unit as a reducing agent is injected into the 75-foot absorber at two points in treatment of the stabilizer gas as it comes from the Dubbs cracking unit

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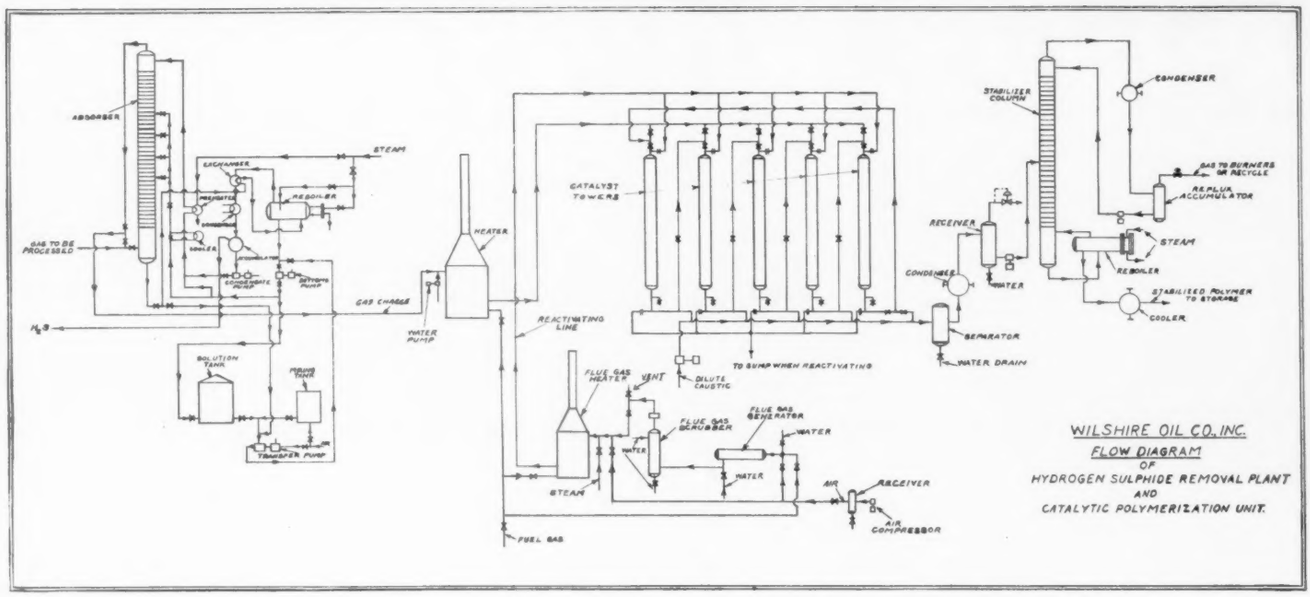


Fig. 4. Flowdiagram of Wilshire's catalytic polymerization unit, and hydrogen sulfide removal unit

ables", which in the above analysis were 4.0% by volume.

The stabilizer gas, which is available at 190 lbs. pressure, is charged to the H_2S, plant where it enters the base of a 75-foot absorber, passes up through 40 bubble trays. The tri-potassium phosphate solution, used to absorb the H_2S, is pumped into the tower at two points—the strong liquor enters at the 20th tray and the weak solution at the top, or 40th tray.

The absorber on the hydrogen sulfide plant will operate between pressures of 160 to 175 degrees F. It is estimated that 50 gallons per minute of strong solution and 18 to 20 g.p.m. of weak solution will be used in treating the gases.

Freed from its hydrogen sulfide, the gas comes off the top of the absorber and goes to the polymerization plant heater in which the temperature is raised to about 450° F. It is necessary to get the temperature above 350° F. in the furnace to start the reaction between the gases and the catalyst in the towers. It is expected this installation will operate between pressures of 150 to 175 pounds.

A SMALL quantity of steam—about 2% by vapor volume — is injected into the gas stream at the entrance of the heater. This is necessary to prevent dehydration and resulting loss of activity of the catalyst under the operating conditions. The humidified heated gas then goes to the catalyst towers.

In the Wilshire installation there are five of these towers so connected in series that any consecutive arrangement may be used. Each tower is 34 feet high and has an inside diameter of three feet. Steel is used in the construction and, for corrosion protection, the inside surface is provided with a 1-inch ganister lining.

The size of the towers is such that the desired results are obtained by using three in a cycle, while one is being reactivated and the fifth is held in reserve. This standby is then placed in the first position of a new series when the catalyst in another tower needs to be reactivated.

Due to the exothermic nature of the polymerization reaction, the temperature of the gases being processed rises during passage through the catalyst bed. The method of rotating the towers allows the positions to be altered so that the most active tower is always used in the first position which is at the lowest temperature, and the least active, at the last position where the temperature is the highest.

Products from the catalyst towers enter a manifold in which they are contacted with cold dilute caustic solution. The purpose of this injection is to prevent corrosion of the outlet lines from small particles of catalyst material which are carried mechanically from the reaction chamber and which tend to become corrosive on contact with water in the liquid phase.

The amount of caustic used is very small being just sufficient to neutralize the acid in this small amount of catalyst. Before entering the condenser the caustic solution is separated from the gas and liquid polymer.

The products next pass through a condenser and into a polymer separator in which a segregation of gas, unstabilized polymer, and water is made. The unstabilized polymer gasoline is then pumped to a stabilizer column in which it is reduced to the desired vapor pressure. The product from this plant will have a vapor pressure of 10 lbs. Reid. The stabilizer gas is discharged to the refinery fuel system.

This process uses the so-called "solid phosphoric acid" catalyst, which is provided in definite shape and size to give a maximum catalyst activity and mechanical strength with a minimum pressure drop. The catalyst — amounting to 11,000 pounds in each tower — is divided into two beds, each 3-feet in diameter by 15½-feet high to give an overall height in each tower of 31 feet.

Because the catalyst loses activity through formation of a coating of carbonaceous material which covers the active surfaces and prevents further reaction with the gases, it is necessary to reactivate the chemical. Burning is resorted to in removing the deposit. During this process it is essential that the temperature is accurately controlled since use of too high a temperature results in sublimation of the catalyst and a loss of activity.

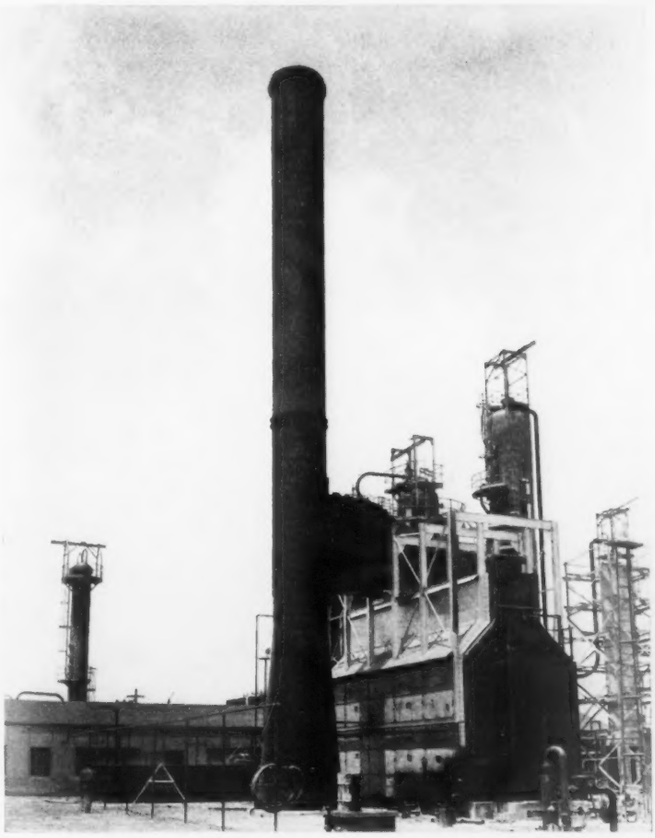
It is expected that this regeneration will take place at intervals ranging from 500 to 1000 hours. That is, the life of the catalyst between regenerations is 500 to 1000 hours.

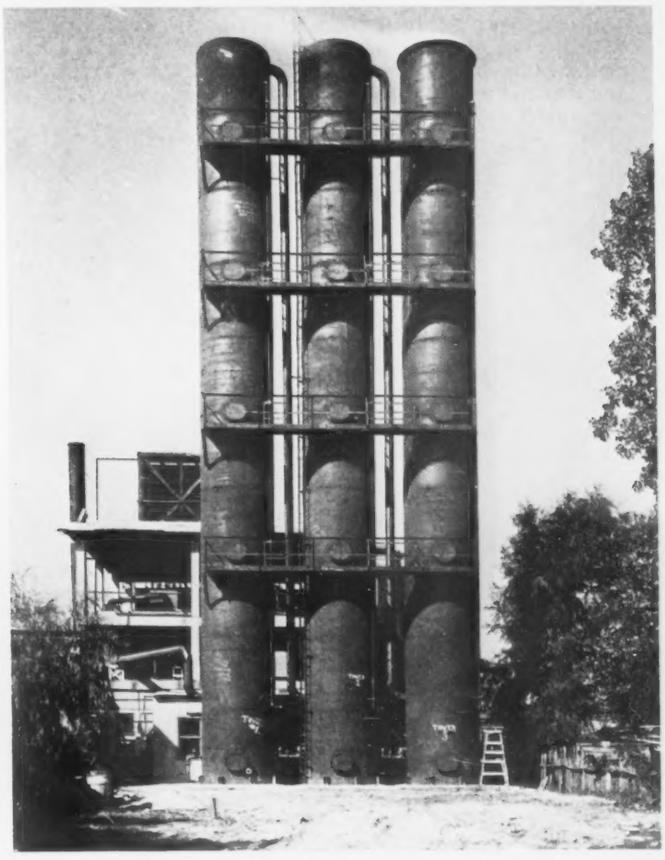
Temperature of the burning operation is controlled by diluting the combustion air with flue gas. This flue gas is generated in a closed system under pressure by burning accurately controlled quantities of gas with air to produce flue gas free of excess oxygen.

The flue gas is then passed to a water scrubber in which the moisture of combustion is removed by direct water cooling. The combustion air is added to the resulting dry flue gas in variable quantities depending on the temperature level in the zone at which the burning is taking place.

This mixture is passed through a preheater and through the catalyst towers. The maximum temperature at which the reactivation may be carried on without damage to the catalyst is about 950° F. This temperature is obtained at first through the use of a very small percentage of air. As the burning proceeds, the allowable amounts of air are gradually increased so that eventually undiluted air is passed over the catalyst beds to insure complete removal of carbon.

After the burning step is complete, the catalyst is still inactive. It is restored to activity, however, by steam-





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ing at atmospheric pressure and a temperature of about 500° F. This steaming step replaces the water of hydration which is necessary for the catalyst activity and which is removed in the burning process.

Claims for this regeneration process indicate that, by proper operation of the burning and steaming steps, it is possible to return the catalyst to an activity equal to that of new chemical. In the course of the reaction some of the catalyst is lost as fines and dust. It has been found that a production of about 50 gallons of polymer is possible from a pound of the catalyst before it is discarded.

To return to the hydrogen sulfide treating plant. Regeneration of the phosphate liquor in this removal plant, which is used in connection with the polymerization unit, is accomplished by heating the solution in a concentrator containing an internal steam-heated reboiler (closed steam coil).

The H_2S and some of the water vapor produced in concentrating comes off the top of the concentrator, goes through a heat exchanger and then to a condenser and finally to an accumulator. The water vapor condenses and the hydrogen sulfide passes off the top of the accumulator to a furnace to be burned. Total amount of hydrogen sulfide to be burned as a result of this operation at the Wilshire plant will be of the order of 10,000 pounds a day.

The polymerization plant was built under license of Universal Oil Products Co. at a cost of approximately $110,000. W. B. Shanley, of that company, has been on the west coast for several weeks preparatory to placing the unit in operation. Fred Behrens, formerly with U. O. P., is now in charge of treating operations for Wilshire. Maurice Machris is vice president of this company in charge of refining and production.

The H_2S unit is a Shell Development process.

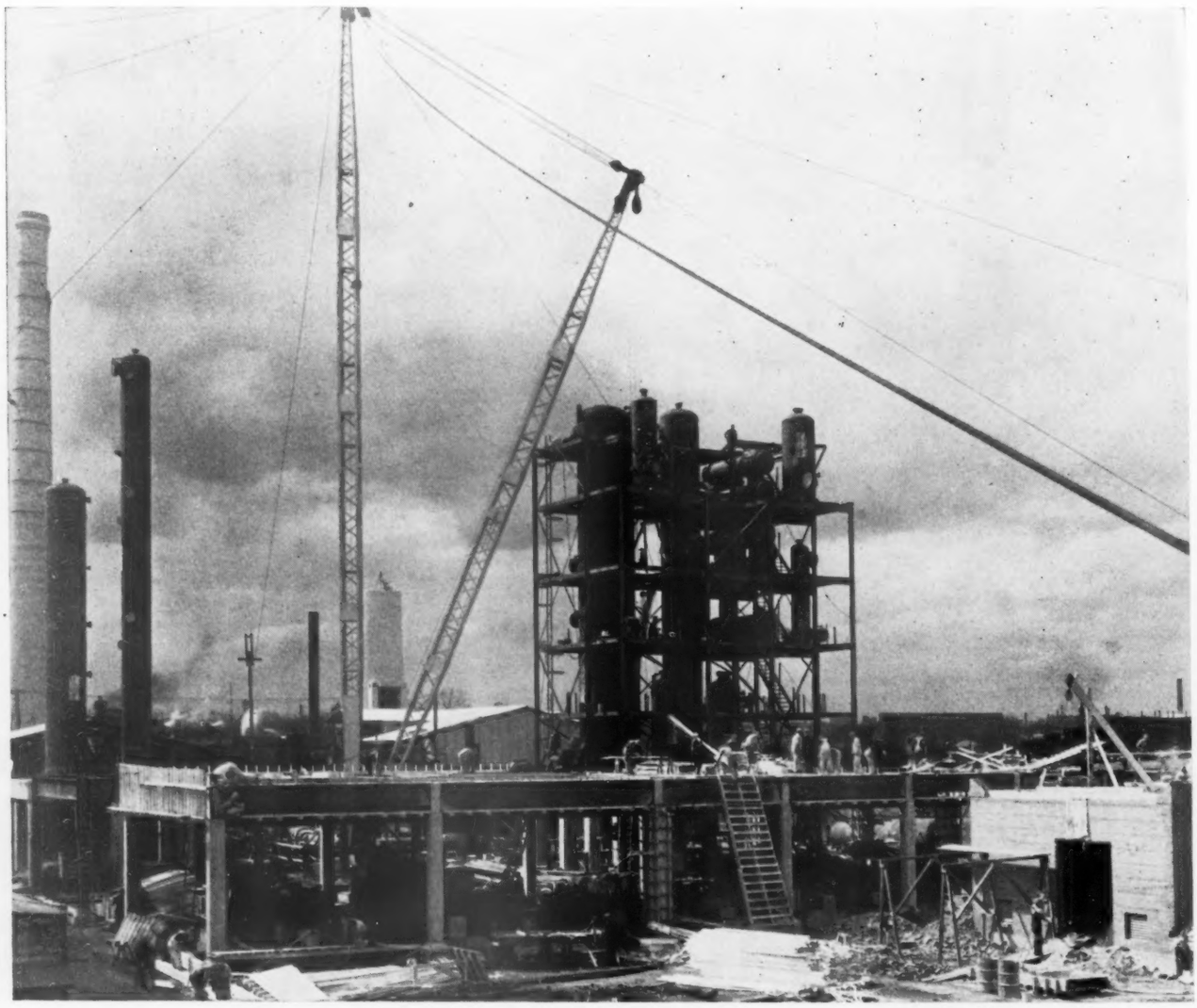
Synthetic Carbon Black in Germany

WASHINGTON—Continuing its efforts to become independent in all its petroleum-product requirements, Germany has turned to anthracene, a coal-tar derivative, as a raw material for carbon black, according to a report made to the Commerce Department from its Frankfort-on-Main office.

This is expected to supplement the synthetic blacks which for the past 18 months have been manufactured from naphthalene, another coal-tar product which now appears to be getting a little too expensive, owing to its scarcity and the heavy demand from other industries throughout the country.

To protect its raw materials, the government has placed an embargo on naphthalene, and a similar one may be expected on anthracene. It is not known, according to the report, to what extent anthracene is being used in manufacture of blacks in the Nazi country, but at least one plant, and a group of tire manufacturers, will use the process.

Despite her efforts to produce carbon blacks by synthetic methods, imports increased to 3520 metric tons during the first four months of this year from 2342 tons in the corresponding period of 1936. During all of 1936, Germany imported 7078 tons of carbon black, of which 6879 tons originated in the U. S.



Thermal polymerization plant being built by the Atlantic Refining Co. at Point Breeze, near Philadelphia. The plant will be the largest of its type in the world and the first to be built in the east. Daily capacity will be 62,500 gallons of gasoline

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Ignition Quality of Motor Fuels

Ignition quality of motor fuels is being probed as much as ever and will continue to be experimented with until much more is known about the chemistry of hydrocarbon combustion and much better correlation between ignition quality in the laboratory and on the road is obtained.

Summarizing some of the reactions which are believed to take place in combustion, their relation to knocking in the Otto cycle engine is said to result from a course of reactions, accompanying the desired combustion reactions, which is slower until the required pressure and temperature are reached for an explosive or detonating reaction.

In the field of test methods a novel knock indicator has been hit upon whose principles are reasonable, experimental results gratifying so far, and whose operation is simple. The method feels the pulse of the knock, so to speak, i. e. it translates the intensity of cylinder vibration, the medium for the sound of the knock, electromagnetically into a milliammeter reading. Though road tests are not completed, this Sunbury Indicator is offered to technologists for more extensive tests.

Certain factors in knock determinations appear to require correction factors by any method. One of these is humidity. It has been assumed that humidity would not cause errors when using the bracketing method but it is now shown that the assumption is not valid.

Ignition quality of diesel fuels is also an erratic procedure. Finding it necessary to revise fuel specifications, the Naval Engineering Experiment Station set out to try all the approved test methods. Ignition delay or computed combustion knock were preferred but it was concluded that if the C. F. R. engine could be re-instrumented to compare diesel fuels on the basis of dynamic combustion shock, the most satisfactory method would result.

In Europe, where cetene number is still used as a measure of diesel fuel quality the influence of composition has been studied and the conclusion drawn that cetene value is closely related to the chemical constitution of the oil.

* * *

Knock Indicator

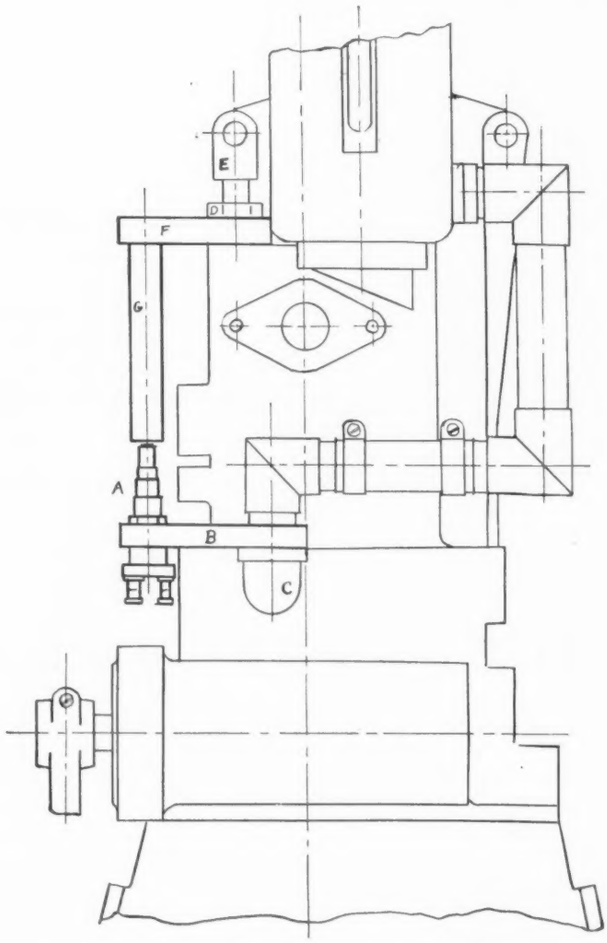
New knock indicator detects strains and vibrations in a cylinder casting. E. S. L. Beale and R. Stansfield. S. A. E. meeting, White Sulfur Springs, W. Va., May 4-9, 1937.

Velocity of vibration in the C. F. R. engine cylinder has been found to be an accurate measure of the effect of knock noise on the ear. An electromagnetic method for measuring the velocity at which the cylinder is strained has been developed which operates by the infinitesimal changes produced by vibration in the length of a .005-inch air gap.

The air gap is formed between magnetic members supported at opposite ends of the cylinder. Changes in the length of the air gap produce changes in the magnetic force acting through the magnetic circuit so formed by the members with the engine cylinder. By means of a coil encircling the magnetic circuit, an amplified electric current is varied through a milliammeter which makes the intensity of the variations visible.

The knock indicator has no moving parts other than the meter pointer and components mounted on the engine are not subject to gas pressure or temperature. Adjustments are not critical and alteration of the air gap affects only the sensitivity without altering ratings. Only one setting of the apparatus is required for the entire octane scale. Provided the connections are made securely the indicator operates either properly or not at all; any false results are due to errors of engine adjustment or engine condition.

The difficulty of reproducing a road acceleration test



1. Arrangement of the knock pick-up unit on C. F. R. engine. The pick-up unit, A, consisting of a permanent magnet into which is pressed a pole of soft iron wound with 5000 turns of fine wire, is screwed into a plate, B, supporting it on the cylinder jacket. A slotted steel plate, F, holds the steel tube, G, to the rocker arm support, E. A soft iron disc in the lower end of the tube forms the upper side of a .005-inch air gap.

on the C. F. R. engine accurately and simply is overcome in an allied type of test with the vibration knock indicator. A blend of reference fuels is determined which matches the sample and the engine is changed rapidly from this blend to the sample, noting the maximum alteration in meter reading and its direction. From this a figure is obtained which represents the relative effect on that fuel of acceleration on the road.

Knowing the required full throttle steady speed road ratings, the acceleration road ratings, and the average road ratings required to reflect users' opinions, the C. F. R. conditions which match the first can probably be determined. Then the change-over test is applied and the steady condition ratings are corrected by a certain percentage of the change-over effects to obtain the required correlation ratings.

By adjustment of the meter damping it is easily possible to reduce the value of the change-over or acceleration effect to suit any required correlation so that a normal test should give a knock rating which indicates full throttle steady driving effects and a rating correction which is a measure of sensitivity to acceleration and which, applied to knock rating, gives the road average rating. The method is believed to be a solution of the correlation problem.

Further tests will be made by this method when comprehensive results from the series of British road tests are available. The development was carried out in the Sunbury Research Laboratories of the Anglo-Iranian Oil Co., Ltd.

* * *

Knock Explained Chemically

The chain mechanism of oxidation of hydrocarbons is summarized to show its relation to knock. G. von Elbe and B. Lewis, Ind. Eng. Chem., Ind. Ed., May 1937, p. 551.

The combustion process in the Otto cycle engines is shown to involve a race between combustion by a moving flame and the spontaneous ignition of a part of the unburnt charge ahead of the flame. In normal combustion the flame travel is completed before the ignition lag is terminated. In knocking combustion the reverse is true.

Oxidation of hydrocarbons consists of two main chain reactions. One is a transformation to an aldehyde followed by oxidation of the aldehyde to carbon monoxide and water. In the process an alkyl peroxide radical, RCH_2OO is formed, which decomposes into an aldehyde and methoxyl. If the peroxide radical meets an aldehyde molecule a reaction known as peroxide branching takes place which leads to explosivity.

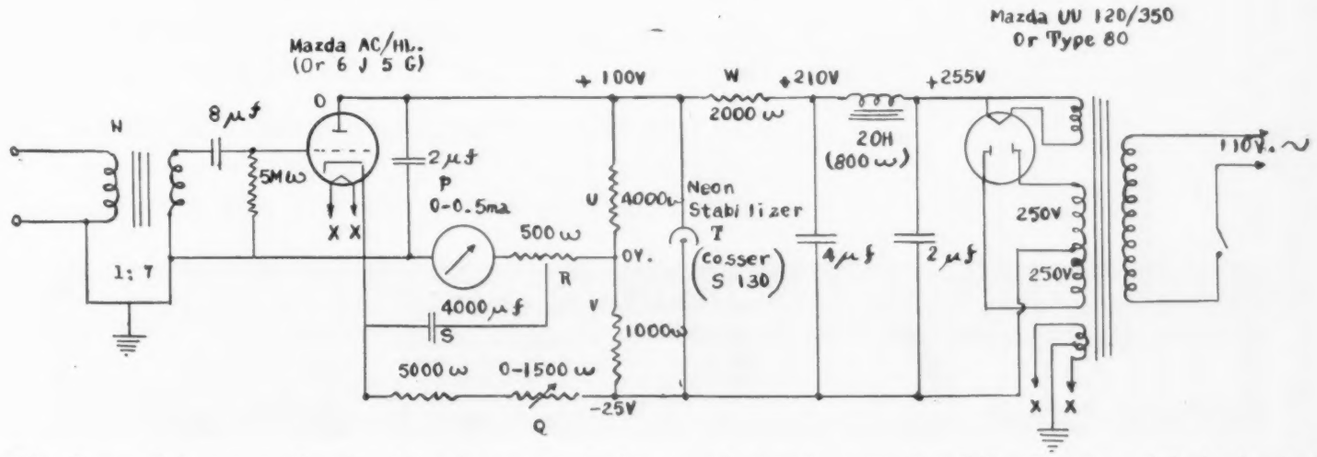
In the laboratory the temperature and pressure can be varied to explore the boundaries of regions of explosive and nonexplosive reaction. At a constant temperature the deeper within the explosive region the shorter the ignition lag. In the Otto cycle engine the temperatures and pressures attained are well within the explosive region and ignition lags are short. Only the length of ignition lag determines whether the moving flame arrives at the end of the combustion chamber before spontaneous ignition takes place.

Two ways are therefore open to reduce the tendency to knock: changes which decrease normal burning time or increase ignition lag. The former can be accomplished by constructing the cylinder head in special ways to allow rapid expansion of the flame area or to produce high turbulence.

Increase of ignition lag may be accomplished by forcing the unburned charge into a narrow space to decrease the reaction rate by increasing the rate of chain breaking. The compression ratio may be decreased or the spark retarded.

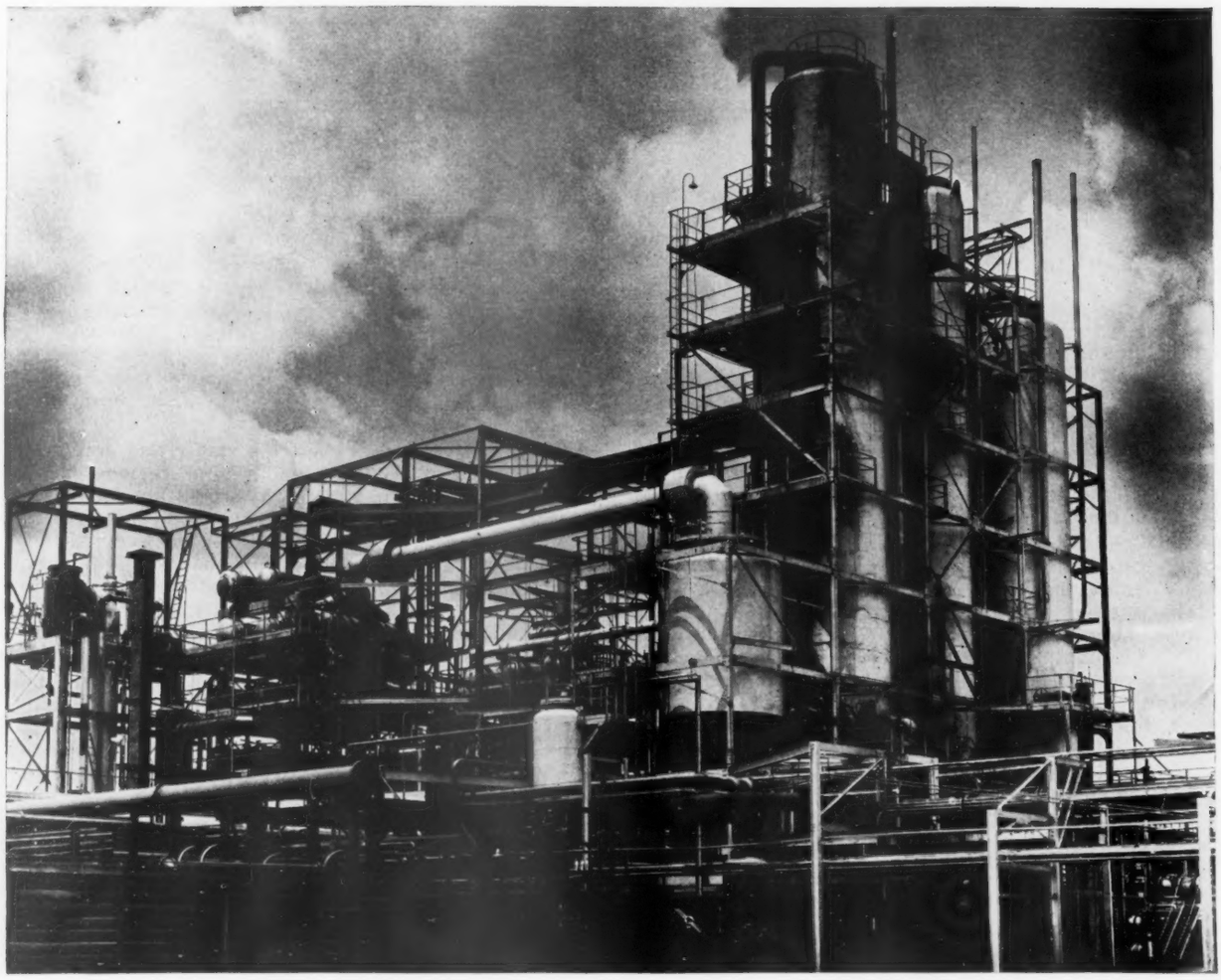
Considering the decrease in the rate of peroxide branching with increasing temperature, it is not inconceivable that, with increasing intake temperature, the knock under certain conditions should be eliminated. This has been found experimentally.

High knock resistance of hydrocarbons with side groups is probably due to formation of ketones rather than aldehydes. Tetraethyl lead has been found to inhibit the chain reaction.



2. Wiring diagram of the vacuum tube unit and damping system used where 110 volt alternating current is available. The pointer of the knock-meter, P, is much steadier than when the bouncing-pin is used, adjustment of air-fuel ratio is much simpler and tests can be made more rapidly

Economic Balance



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Patent Literature OF TODAY

Flash chamber. No. 2 079 333, *May* 4, 1937; *filed March 2, 1935; R. M. Parsons, assignor to The Ralph M. Parsons Co.; one drawing; one claim.*

A flash chamber for an oil cracking plant is designed with a bottom well of smaller cross-section than the chamber. In the well is a discharge port below liquid level, and a float operable in response to changes in liquid level. A discharge line connected to the port has a cooling coil to prevent coking or clogging a valve used to control the rate of discharge of the liquid and a constant pressure pump to rapidly withdraw liquid from the well when the valve is open but adapted to prevent excessive pressures when the valve is closed or restricted.

The float is connected to the valve for automatic operation to maintain a constant liquid level just over the discharge port while maintaining a small exposed surface and a minimum quantity of liquid in the well to draw heat from the chamber.

* * *

Acid recovery. No. 2 079 424, *issued May* 4, 1937; *filed Dec.* 27, 1933; *C. L. Read and P. J. Harrington, assignors to Standard Oil Development Co.; no drawing;* 4 *claims.*

High viscosity acid sludge obtained by treating oil with fuming sulfuric acid, is decomposed with an acid oil that has been separated, after dilution with water, from a low viscosity sludge obtained by treating a light distillate with sulfuric acid. The mixture of sludge and acid oil is diluted with water and dilute sulfuric acid and acid oil are separately removed.

* * *

Cracking. No. 2 079 776, *issued May* 11, 1937; *filed April* 21, 1931; *L. G. Story, assignor to The Texas Co.; one drawing;* 5 *claims.*

Fresh charting stock is stripped by contact with vapors from coking operation. Clean cracking stock is separated for a pressure cracking system and selected cuts are separated for vapor phase cracking. Residue liquids from stripping and pressure cracking are coked by the sensible heat of the vapor phase cracked products.

The process is flexible so that a wide selection of cuts for cracking may be made by segregating various fractions according to the desired volatility or refractoriness. The low boiling products vaporized in the pressure cracking operation may be separately dephlegmated to produce selected cuts for vapor phase and liquid phase cracking. The residual liquid or pressure tar may be flash distilled under reduced pressure to likewise produce selected cuts for the same purpose, if desired.

The entire vapor fraction from both pressure stills and the flash still may be concentrated in one large tower, which also receives vapors from the crude stripper, and the resulting vapors fractionated to separate the desired gasoline, and to produce at the same time a fraction suitable for vapor phase cracking stock and a clean condensate adapted for pressure still cracking.

* * *

Pour point depressant. No. 2 080 088, *issued May* 11, 1937; *filed Oct.* 25, 1933; *F. R. Moser, assignor to Shell Development Co.; no drawing;* 13 *claims.*

Asphaltenes are precipitated from a polymerized extract derived by extracting minerol oil with a selective solvent for non-paraffinic hydrocarbons by adding a liquid precipitant for asphaltenes to the polymerized extract. The precipitate and precipitant are removed from the unprecipitated portion, thereby concentrating active pour point-reducing substances in the unprecipitated portion.

* * *

Treatment. No. 2 080 087, *issued May* 11, 1937; *filed Aug.* 11, 1934; *M. Mizuta and T. Yoshimura, assignors to Nippon Sekiyu Kabushiki Kaisha; no drawing; one claim.*

Oil-soluble heavy metallic soap of abietic acid is dissolved in a volatile organic solvent which will disperse homogeneously in cracked oil. The solution is poured slowly into cracked oil while in the cold state to react with the intermingling mercaptans and precipitate them by double decomposition as insoluble metallic salts. The precipitate is separated and the remaining liquor is distilled to separate it from the organic solvent.

* * *

Cracking. No. 2 080 820, *issued May* 18, 1937; *filed Oct.* 12, 1929; *E. W. Isom, assignor to Sinclair Refining Co.; one drawing;* 4 *claims.*

In combination with pressure distillation operations for the manufacture of gasoline by cracking heavier and higher boiling hydrocarbon oils, an intermediate stock higher boiling than gasoline and lower boiling than the stock subjected to the pressure distillation, and a tar including pitch constituents, are taken off from the pressure distillation. This intermediate stock is cracked at a high temperature and the hot products passed to a separate receptacle from which vapors are taken off. The tar is introduced directly into this receptacle and is cracked further by the heat of the hot oil products discharged from the heating conduit.

* * *

Acetylene. No. 2 080 931, *issued May* 18, 1937; *filed Dec.* 20, 1935; *J. R. Rose, assignor to M. L. Benedum and J. C. Trees; one drawing;* 10 *claims.*

Acetylene is produced by subjecting methane or natural gas to the action of an electric arc under 50-200 atmospheres pressure, sufficient to prevent polymerization. Gaseous products thus formed, acetylene and hydrogen are cooled below polymerization temperature and collected. Benzene can be produced by polymerization of the gases in a heater. Patent No. 2 080 932 covers apparatus design and No. 2 080 933 the heater for benzene production.

* * *

Cracking. No. 2 081 347, *issued May* 25, 1937; *filed June* 8, 1934; *C. H. Angell, assignor to Universal Oil Products Co.; one drawing;* 15 *claims.*

Excess heat from a low-pressure coking operation included with a cracking process, is utilized to effect fractional distillation of charging stock. The unsatisfactory motor fuel components of the vaporous products from the coking operation, together with any motor fuel components of the charging stock of poor anti-knock value, are reformed.

* * *

Cracking. No. 2 081 348, *issued May* 25, 1937; *filed Oct.* 28, 1935; *C. H. Angell, assignor to Universal Oil Products Co.; one drawing;* 4 *claims.*

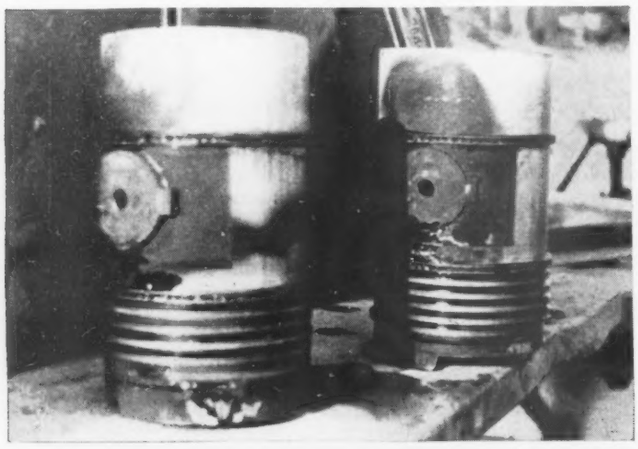
Hydrocarbon vapors are contacted with charging oil in a vaporizing zone and uncondensed vapors and unvaporized oil are separately removed from the zone. The unvaporized oil is distilled to coke in a coking zone and the uncondensed vapors are fractionated to separate heavier from lighter fractions. The heavier fractions are cracked under pressure and then discharged into the coking zone from which vapors are removed to a vaporizing zone. At least a portion of the lighter fractions are passed through a second heating coil at higher cracking temperature and the resultant products are separated into heavy and light components. The heavy components are introduced into the vaporizing zone.

* * *

Solvent extraction. No. 2 081 497, *issued* May 25, 1937; *filed Jan.* 14, 1935; *D. R. Merrill, assignor to Union Oil Co.; one drawing;* 12 *claims.*

The invention consists of a selective solvent extraction process operating in several main stages in which each main stage consists of a mixing stage, a primary settling or treating stage, and a secondary settling or rejection stage. The raffinate from each extraction stage is introduced into a subsequent mixing stage. The extract from each extraction stage is passed into a secondary settling or rejection stage operating at a reduced temperature

Pistons from a Caterpillar Diesel D-11000 Tractor after 4,200 hours operation on an SAE 30 Alox-blended Pennsylvania oil.



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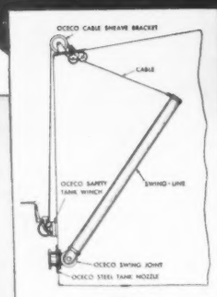

● Oceco swing line equipment consists of a steel nozzle, a heavy duty swing joint that will not twist or leak, a gas-tight stuffing box and cable sheave mounted on the tank top, and winch—all of Oceco's serviceable design and dependable manufacture. Winches are worm geared and self-locking. Oceco swing lines meet any tank requirement. Write for descriptive literature.

●

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OCECO FITTINGS
your tanks
deserve the best

●

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wherein certain desirable fractions are rejected in a separate raffinate phase, simultaneously producing an extract in this rejection stage of poorer quality than the extract entering from the treating stage.

This extract phase produced in equilibrium with the rejected raffinate is transferred as produced into the mixing stage of a next lower main stage to serve as a selective solvent. By rejecting part of the oil from the extract phase in multiple rejection, the remaining extract which is used as solvent in a lower extraction stage has added solvent power due to the deficiency of oil in the extract phase.

Rejected raffinate from the rejection stage is returned to the original mixing stage of the same main stage where it is commingled with the oil and solvent entering this stage. By passing upwards in the system accumulation of good oil in the lower or cooler sections is prevented. Such accumulation would reduce the concentration of poor oil of high naphthenicity by dilution and interfere with the extraction of such poor oil. Good oil is prevented from being carried down the system by the extract phase by means of the rejection stage which returns the good oil at each stage permitting the poor oil to go down.

Patent No. 2,081,498 covers neutralizing acid constituents with an alkali prior to extraction.

* * *

Stabilization. No. 2 083 253, *issued June* 8, 1937; *filed March* 21, 1935; *I. Budowski; no drawing;* 3 *claims.*

Undesirable components are converted to polymers and gums easily separated from the hydrocarbon by mixing an alkaline bichromate in a dry powdered form with the hydrocarbon in the presence of powdered graphite. The mass is thoroughly agitated to obtain uniform dispersion of the bichromate oxidizing agent and the graphite extending agent while slowly adding concentrated sulfuric acid. The mixture is allowed to settle and the treated hydrocarbon separated.

* * *

Emulsion breaking. No. 2 083 801, *issued June* 15, 1937; *filed Sept.* 6, 1932; *H. C. Eddy, assignor to Petroleum Rectifying Co.; 7 diagrams;* 16 *claims.*

An oil-water emulsion is atomized by any of several means into minute liquid particles separated from each other by a gas and subjected to an electric field which ionizes the gas and dehydrates the oil. The process is accomplished in a vertical tank containing a cylindrical electrode within which the action takes place.

Pat. No. 2 083 802 covers a similar dehydration is a different form of apparatus in which a foam is formed between the electrodes.

* * *

Solvent refining. No. 2 083 893, *issued June* 15, 1937; *filed April* 17, 1935; *L. A. Clarke, assignor to The Texas Co; no drawing;* 15 *claims.*

Oil is mixed with an aromatic amino ether having the character and solvent action of anisidine and phenetidine. An extract phase containing relatively non-paraffinic constituents dissolved in the solvent liquid and a raffinate phase comprising the relatively paraffinic constituents are formed.

* * *

Sweetening. No. 2 083 917, *issued June* 15, 1937; *filed April* 8, 1935; *J. M. McGee, assignor to Standard Oil Co. (Ind.); no drawing;* 14 *claims.*

Petroleum distillates are sweetened by contacting in the liquid phase with a catalyst consisting chiefly of calcined magnesium oxide in the presence of an oxidizing agent (air, oxygen, or sulfur). The process is an improvement over the use of magnesium hydroxide. Less sulfur is used and magnesium oxide can be reactivated readily for reuse. Gasoline is passed from top to bottom of a tower packed with the oxide.

* * *

Cracking. No. 2 082 224, *issued June* 1, 1937; *filed May* 3, 1933; *H. R. Snow, assignor to Standard Oil Co. (Ind.); one drawing;* 12 *claims.*

Fresh charging stock, such as crude oil, is stripped successively by vapors derived from a tar flashing operation, vapors from a viscosity breaking cracking operation

and vapors from a vapor phase cracking operation. The stock is then subjected to the viscosity breaking operation mentioned. A final desired distillate such as gasoline, as well as heavier clean condensate is formed from the lighter vapors of the vapor phase cracking operation combined with the lighter vapors from the stripped crude and this condensate is used as the charging stock for the vapor phase cracking operation. Other condensate products are also segregated as a result of the crude stripping operation. A particular advantage is that the tarry residues produced by the vapor phase cracking operation and the viscosity breaking operation are separately collected for individual disposal.

* * *

Solvent extraction. No. 2 081 524, *issued May* 25, 1937; *filed Oct.* 27, 1934; *C. D. Barnes, assignor to Union Oil Co.; no drawing;* 15 *claims.*

In a process for separation of petroleum oils into their paraffinic and non-paraffinic fractions by extraction with highly selective solvents, an amide is added to modify the miscibility temperature. The amide is selected from the class consisting of acetamide, propionamide, benzamide, acetanilide, acet-B-naphthalide, and acet-O-toluidide.

* * *

Cracking. No. 2 081 534, *issued May* 25, 1937; *filed June* 29, 1934; *C. B. Forward, assignor to Forward Process Co.;* 2 *drawings;* 9 *claims.*

Motor fuel containing over 75% aromatic hydrocarbons is produced by continuously cracking distillates under several hundred pounds pressure at 950-1050° F. without separation of any constituents while passing rapidly through piping. At least 40% of the oil is converted to the gasoline range.

Heated products are discharged to an enlarged reaction chamber in which an exothermic reaction produced by the polymerization of constituents of the oil continues the cracking at the same temperature long enough to produce an oil of about 38° Be. gravity and at 850-975° F. to pass through a one-inch coil about 2400 feet long when supplied at 180 gallons per hour with an outlet pressure on the coil of 225 pounds per square inch.

* * *

Dewaxing. No. 2 081 732, *issued May* 25, 1937; *filed Nov.* 6, 1933; *U. B. Bray and D. E. Carr, assignors to Union Oil Co.; one drawing;* 15 *claims.*

Wax is separated in the production of lubricating oils by refrigeration in the presence of a diluent in several stages in which the solvent-to-oil ratio is decreased as wax is separated in each stage. A feature is the use of liquefied normally gaseous hydrocarbon solvents such as propane, as a diluent for refrigeration of the oil to precipitate wax and to give good settling and filtration of the solution containing precipitated wax. Progressively decreasing temperatures are used for wax precipitation in the several stages.

Separation of asphalt and wax mixtures is covered in patents No. 2 081 733-4.

* * *

Solvent recovery. No. 2 081 884, *issued May* 25, 1937; *filed Aug.* 16, 1934; *E. N. Roberts, assignor to Standard Oil Co. (Ind.); one drawing;* 2 *claims.*

A solvent partly soluble in water is stripped from oil with a current of solvent vapors and steam in a first stripping zone. Oil is withdrawn separately from solvent vapors and steam which are then condensed. Condensed solvent is separated from condensed water containing the solvent dissolved therein, and the dissolved solvent is stripped from condensed water with a current of steam out of contact with oil in a second stripping zone.

* * *

Polymerization. No. 2 084 082, *issued June* 15, 1937; *filed Jan.* 26, 1934; *L. H. Fitch, Jr., assignor to Phillips Petroleum Co.; no drawing;* 13 *claims.*

Tertiary olefins are selectively polymerized by contacting with solutions of anhydrous ferric chloride in an alcohol of the group: methyl, ethyl or isopropyl, said solutions having a specific gravity of 1.0-1.4.

Donnelly Cracking Process

The

Process

of

Pyrolytic Perfection

Donnelly Process users don't worry about the character of charging stock available, they know their Donnelly unit will refine it economically;

The Refiner determines the quantity and quality products he can market most profitably and the operators adjust the unit for the production of those products.

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20 North Wacker Drive
CHICAGO, ILLINOIS

Nomographic Chart for Finding Reciprocating Pump Capacities

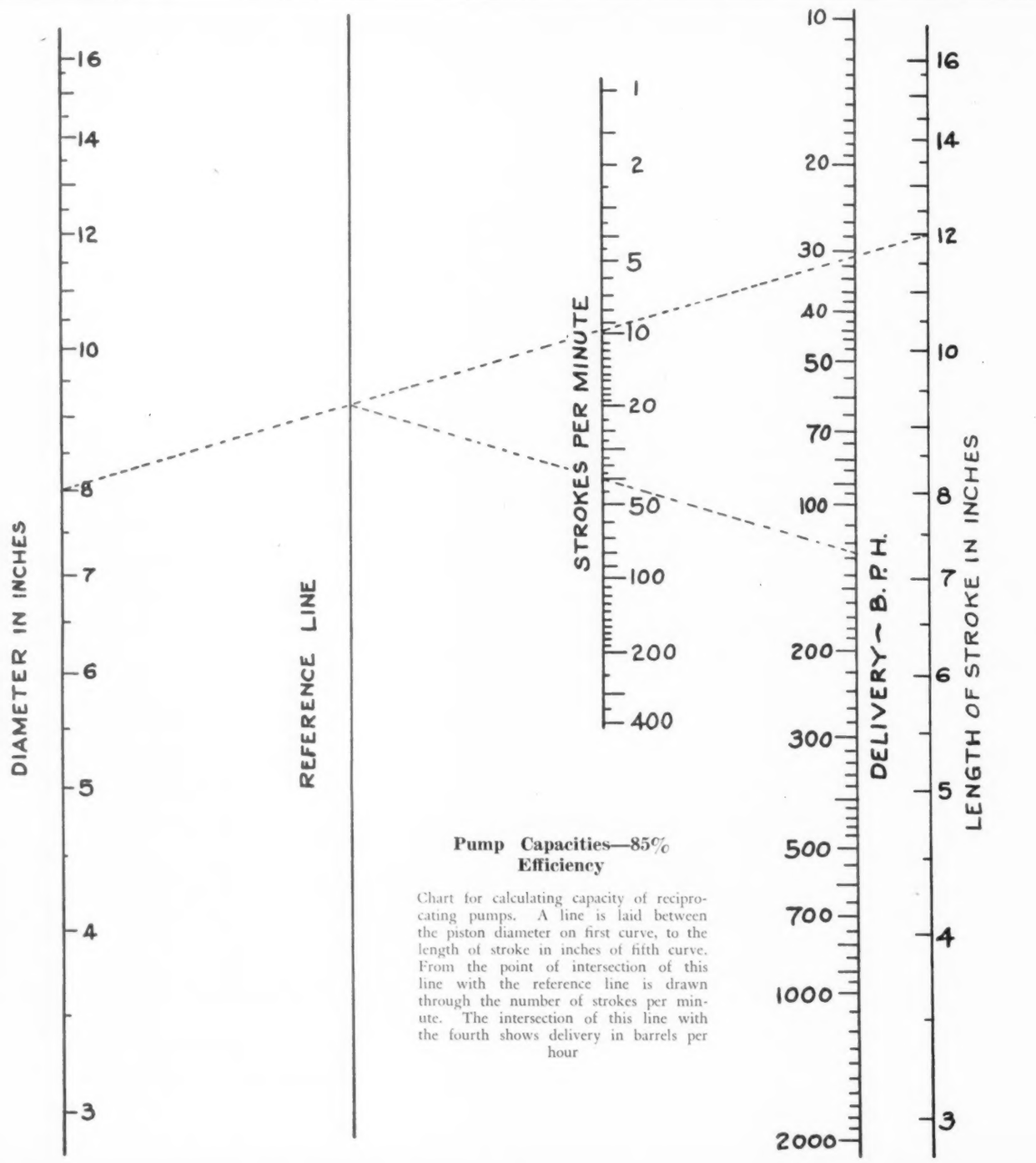
748.1

By ARTHUR NORTON

IT is customary in ordinary plant operation to estimate the flow of fluids from pumps in process lines on which there is no meter, by means of counting the number of strokes which a given pump may make in a minute. This is very often only a relative figure, no attempt being made to convert the pump strokes to B.P.H. or G.P.M.

The nomographic chart attached provides an easy method of determining the flow from a reciprocating pump by counting the pump strokes. For the example shown on the chart, the flow from a pump having a liquid end of 8″ I. D. x 12″ long traveling at 40 strokes per minute will discharge 125 barrels per hour at the flowing temperature and pressure, assuming 85% volumetric efficiency on the pump.

The strokes are determined by counting the number of times the piston moves against the liquid end. A duplex pump having twice the number of strokes as a simplex pump for the same piston speed, likewise a double acting pump will have twice the number of strokes as a single acting pump.



Pump Capacities—85% Efficiency

Chart for calculating capacity of reciprocating pumps. A line is laid between the piston diameter on first curve, to the length of stroke in inches of fifth curve. From the point of intersection of this line with the reference line is drawn through the number of strokes per minute. The intersection of this line with the fourth shows delivery in barrels per hour

Activities OF EQUIPMENT MANUFACTURERS

Feed Water Regulator

A new two-element Steam-flow type of boiler feed water regulator, known as the Copes Flowmatic Regulator, has been introduced by Northern Equipment Co., Erie, Pa. One of the two control elements, the steam flow controller, measures the rate of steam flow by taking the pressure drop through the superheater. The water level thermostat, with tension type expansion tube, is connected mechanically to the feed water control valve in such a way that the valve is positioned by the resultant of two forces. Several commercial installations are now in operation after two years of tests.

* * *

Steam Hose

The B. F. Goodrich Co., Akron, Ohio, has introduced a Burst-Proof steam hose. When this hose fails it will leak but nothing can cause it to burst except an external blow severe enough to cut the wire reinforcement, it is said. It is recommended for 200 pounds working pressure in all sizes, with a safety factor of 15 to 1 in larger diameters and up to 35 to 1 in the small diameters. Wire is applied in a braided form with openings large enough to permit the rubber to rivet itself. Outside the wire braid and underneath the cover is embedded an additional braid of strong asbestos cord to protect the cover from burning.

* * *

350-Pound Valves

The Hancock Valve Division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn., announces a new line of 350-pound bronze globe and angle valves in sizes from ¼ to 2 inches.

Heat-treated stainless steel seats and discs feature the new valves. The makers claim this hardness provides exceptional resistance to steam cutting and wire drawing.

* * *

Display at Houston

An exhibit, graphically showing methods for handling the various cleaning operations presented by the oil industry, has been prepared by Oakite Products, Inc., for the Houston oil show October 11 to 16.

The Oakite Booths will be in charge of J. A. Carter, assistant sales manager, and will be attended by J. C. Leonard, Chicago division manager, Wm. A. Dowen, Texas Representative, E. Rightor, New Orleans Representative and J. R. Whyte, Tulsa Representative.

* * *

Instruments

Information on the latest developments in indicating and recording temperature and pressure instruments, some of which has never before been published, is contained in the new 56-page booklet No. 1060 C, put out by C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

Complete data on its line of instruments, together with photographs of practical installations, indicate how these instruments serve the process industries.

* * *

Flow Integrator

A new electric integrator developed by The Bristol Co., Waterbury, Conn., totalizes flow of gas or non-viscous liquid once every 15 seconds, for Bristol flow meters. The device mechanically computes the square root of the differential pressure across an orifice plate or venturi tube constriction in a pipe line. Valves obtained are totalized by means of a counter and are indicated on a six-figure integrator dial. The integrator is described in catalog No. 1050.

Typical examples of telemetering and remote control by means of Bristol's Metameter are shown diagrammatically in Bulletin No. 490, just issued. A complete line of Metameter telemetering instruments for recording or indicating pressure, liquid level, flow, temperature, mechanical motion, electrical units and totalized power load are included.

* * *

Turbine Pumps

Turbine pumps are described and illustrated in Bulletin 260-B11C just issued by Roots-Connersville Blower Corp., Connersville, Ind. Special emphasis is placed on their application in the industrial field. The pumps cover the range from 2½ to 175 gallons per minute with heads up to 500 feet. Supplemental table, Form E11F, carrying the heads up to 700 feet, is available.

* * *

Meehanite Metal

A bulletin on Meehanite metal has been published recently by The Cooper-Bessemer Corp., Mount Vernon, Ohio. This metal is used in all iron casting that go into the construction of Cooper-Bessemer engines and spare parts. The improved qualities of parts are shown by figures, charts, and photographs.

* * *

Expansion Joints

A new expansion joint bulletin EJ-1906 has been issued by Yarnall-Waring Co., Philadelphia. Considerable space is devoted to explaining the Yarway Gun-Pakt feature by means of which packing may be forced into the stuffing box while the joint is under pressure thus eliminating shutdowns for repacking.

* * *

T. S. Jones, formerly of the Tulsa branch of Crane Co., Chicago, has been transferred to the oil sales department covering the states of Kansas, Oklahoma and the Panhandle of Texas.

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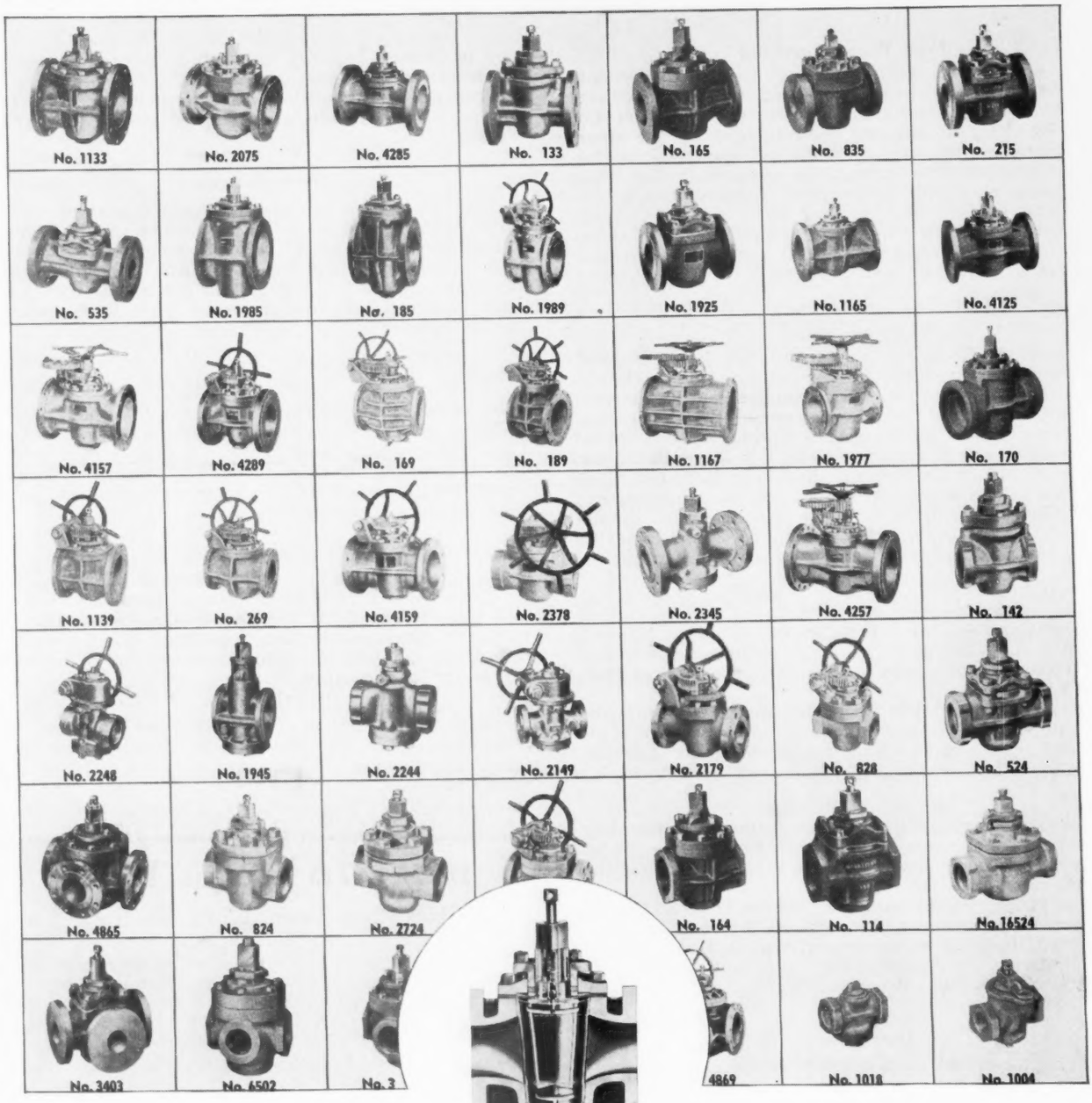
(*See also Page 68*)

Your UNRESTRICTED *choice of Nordstroms*



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Made from Alloys to meet your needs

For all service in drilling, production, refining, transmission, and distribution, there is a type and size of Nordstrom Lubricated Plug Valve to meet every requirement. Sizes run from half inch to 30 inches—working pressures up to 5000 pounds—available for handling temperatures from −60°F to +600°F.

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The new Boeing B-17 "Flying Fortress" built recently for the Army Air Corps, flying at 13,000 feet elevation. Official Photograph U. S. Army Air Corps

SUPER FUELS FOR FASTER FLYING

Oil Companies Now Prepared To Supply 70 to 75 Million Gallons Annually of 100 and Higher Octane Number Gasoline

By ARCH L. FOSTER
N. P. N. Technical Editor

SIXTY million gallons of 100 octane number, aviation fuels will be required annually by the military establishments of the U. S. alone within another year, if present plans of the War and Navy departments are realized, according to the best information obtainable at present, and perhaps 8 to 12 million gallons by the commercial air lines.

The Air Corps of the War Department plans to use at least fifteen million gallons of this super-fuel in the first half of the calendar year 1938. For the fiscal year 1939, starting July 1, the Army expects to be 100 per cent converted to 100 octane number fuels, although not all equipment will be fitted with engines requiring that grade of fuel, it is understood.

The Navy Department also expects to go to this grade of fuel if, when and as soon as, appropriations are available to make this adoption. As this department probably will use approximately the same amount of fuel as the army, the indicated consumption of super-fuels by the two establishments will probably be between 50 and 60 million gallons.

While commercial aviation will be somewhat slower to adopt entirely this grade of fuel, at least two major airlines are experimenting, in regular service, with planes powered with engines requiring 95-100 octane number fuels. From this experimental flying will be obtained data on the practicability and economy of using such fuels and engines as regular equipment.

For all this rapid change to a type of aviation fuel which, until two years ago, was considered only a laboratory research tool, "There's a reason." That reason is pay-load efficiency in the case of commercial planes, military tactical advantage in the case of fighting planes. For military purposes, almost any price can be paid for a mechanical advantage which renders the air fighter superior to his opponent in maneuvering power or speed. Cost ceases to be an object or an objection. For this reason alone the military services are more ready to adopt a fuel giving such an advantage than is commercial aviation.

In commercial flying, the "bottle-neck"

Joint Progress in Aviation

To bring up to date the situation of the new aviation super-fuels;

We have a wealth of material from which these fuels may be produced as fast as demand for them grows.

We have adequate and efficient processes for their manufacture, and can produce, with the aid of tetraethyl lead in permissible quantities, fuels of as high as 120-125 octane number, if and when required. Such fuels will be needed in a very few years, prognosticators believe.

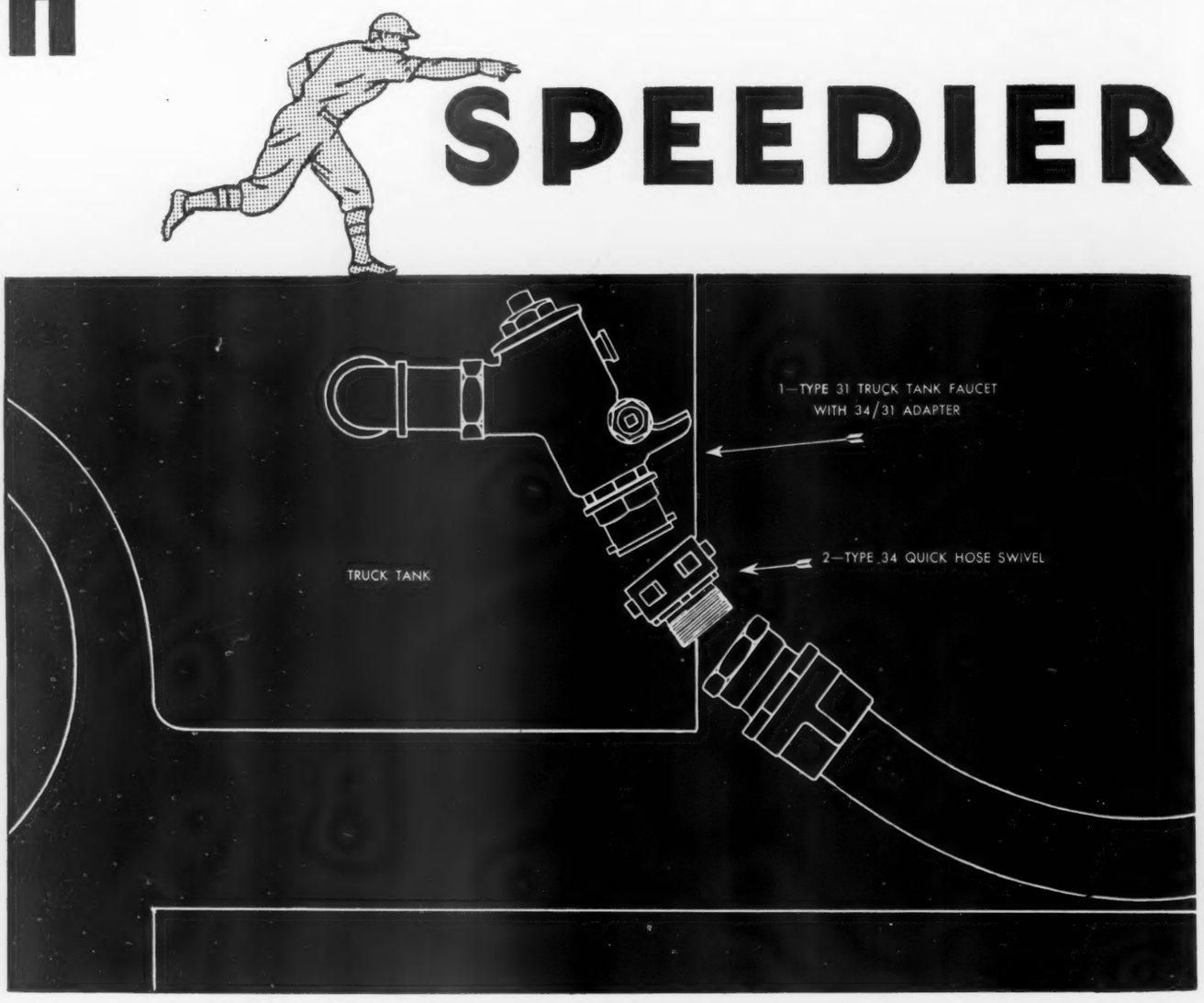
Aviation engine builders are designing and building engines which will utilize all the power efficiency inherent in these fuels—iso-octane, i-propyl ether, the aromatics, isopentane, isobutane, etc.

1400-1500 horsepower engines are now being fitted to suitable new planes for commercial service, to use these fuels.

The U. S. Army and Navy Air Corps are soon to standardize on 100 octane number fuels, which are more indispensable to military services than for commercial purposes.

At least nine iso-octane units can supply all this material required even if all aviation goes to its use one hundred per cent.

Here are the fittings SPEEDIER



Every inch of the way—from truck tank faucet to

1—Type 31 Truck Tank Faucet with 34/31 Adapter. This streamline, non-chattering, non-hammering faucet saves shocks and strains on fittings because it is the *smoothest closing* faucet made. And it saves time in every delivery because it gives *full flow* from 1½ to 3 inches at *exceptional speed*. It is of standard size and fits all standard fittings and hose.

2—Type 34 Quick Hose Swivel. Has three slots instead of two, which gives a quicker, tighter connection. And every connection is gas-tight. To connect, you just slip the coupling over the lugs of the adapter on the faucet and give the coupling a part turn. This eliminates the costly practice of screwing the delivery hose coupling onto the faucet every time a connection is made. It saves wear on threads in both coupling and faucet. And it cuts the delivery time to a minimum.

3—Type 80 Effluent Quick Fill Coupling. Designed to connect hose and fill box with the utmost speed. Has handles which fold back, so that it may be carried easily in the tube carrier on the truck tank. When extended, these handles are grasped for turning the coupling and making a quick connection.

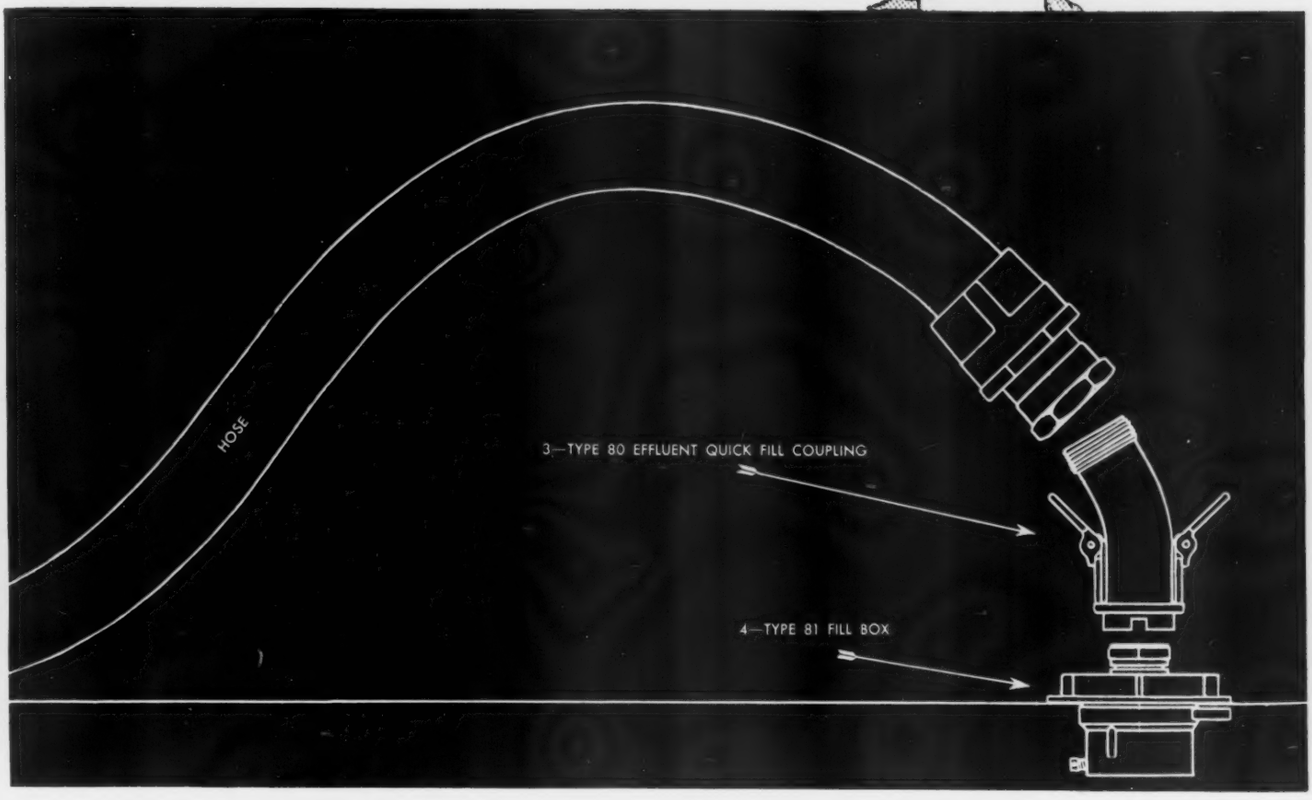
4—Type 81 Fill Box. A theft-proof, water-tight, vapor-tight fill box. It prevents waste of gasoline through evaporation, eliminates fire hazards, and assures quick connections. The cover has a gauge for measuring the contents of the storage tank.

If they're **Wheaton** *they're safe*

FAUCETS • VALVES • JOINTS • COUPLINGS

that team-up to give you

DELIVERIES



fill box — this Wheaton assembly saves money

● This Wheaton delivery assembly is designed to do one thing—to make deliveries *faster*, *safer* and *more economical* than they have ever been made before.

Four fine products team-up to make this possible—a truck tank faucet that gives a full, fast flow; two quick hose couplings that assure quick, tight, gas-tight connections with both truck tank faucet and fill box; and a fill box that is theft-proof, water-tight and vapor-tight. From truck tank faucet to fill box, this Wheaton assembly sees to it that nothing is overlooked to give quick, safe, money-saving deliveries. It is the last word in delivery equipment—and the first thing you should think of when planning the improvement of your deliveries.

Read the brief descriptions of these four products on the opposite page. Then let us send you samples for your own test—with the Wheaton money-back guarantee.

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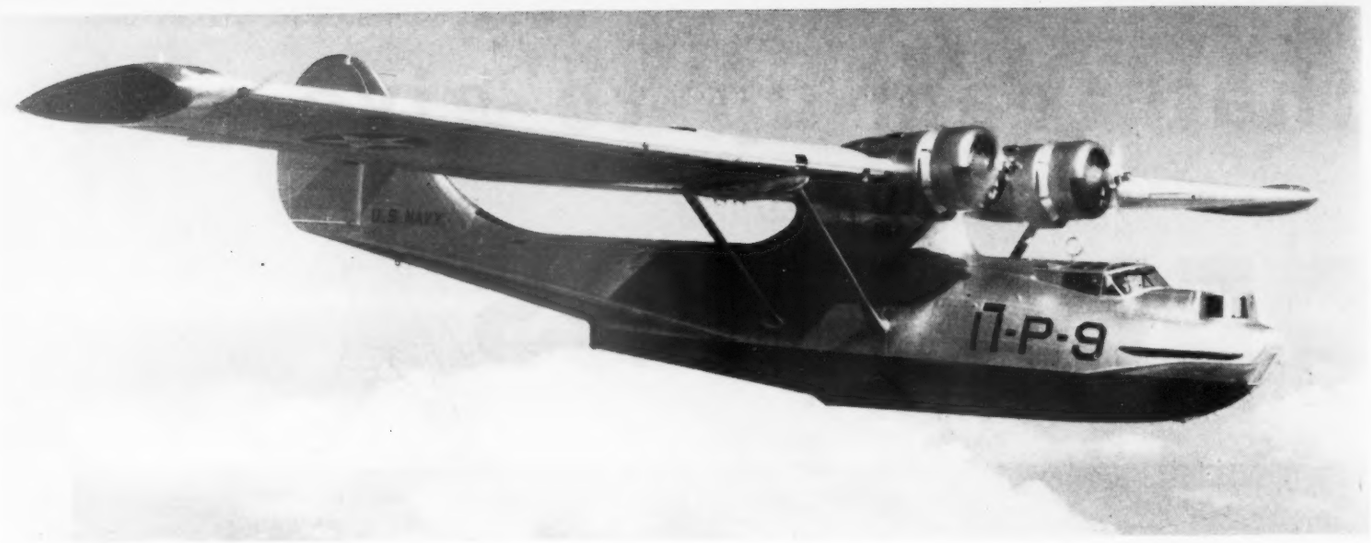
FILLERS • NOZZLES • WRENCHES • FITTINGS



The new Consolidated-built patrol bomber, using 2 Pratt and Whitney 850 hp. engines. Navy Air Corps has ordered 176 of these planes, and has used them in mass formation flights to Hawaii. Official Photograph, U. S. Navy

is the ability to lift a given pay-load off the ground within the areal limits of the ordinary flying field. A second important factor is cruising range or, looking at it from the other angle, the amount of dead load, in the form of fuel, which must be carried for a given flight distance. After experimental testing of 100 octane number fuels in laboratory and in flight by several companies, the data were summed up by Barnard[1] early this year, who stated that the revenue-earning power of aviation gasoline may be increased by from two to five cents per octane number of improvement.

More startling and more important to the industries which produce and use these super-fuels is the calculated greater earning power of 29.3 cents per gallon for 100 octane number fuel as compared with 87 octane number fuels, which Barnard finds to be the case by careful calculation based on exhaustive flying data. This additional return he states can only be realized in planes and engines designed to utilize all the anti-knock quality inherent in the better fuel. He reports a fuel economy of 0.34 lb./b.hp./hr., as compared to around 0.45 lb. as now obtained in most engines using 87 octane number fuels, in the best operation.

Young[2] has shown that about 20 per cent better economy can be obtained with Army 100 octane number fuels than can be had with 92 octane number fuels (Army Method, about 87 octane number by A.S.T.M. Method) Klein[3] states that, for maximum output, a high degree of supercharge with not too high compression ratio, is needed, while for maximum economy a high compression ratio is essential. Adding as much as 6 cc. of lead tetraethyl to iso-octane showed an increase of 90 per cent power output compared to the same engine using Army 92 octane number fuel.

There is no longer any doubt regarding the efficiency of 100 octane number fuels in engines designed for them. Nor is there any doubt as to the aviation industry's willingness to use these fuels as soon as engines are available and as soon as the fuels are available at economical prices. Engine designers are working feverishly to perfect engines to properly utilize the inherent efficiency of the newer fuels.

The problem for the refining industry to solve is the sources from which these fuels may be obtained and the perfecting of economic processes for their manufacture. Much of this combination problem has already been solved. Polymerization of refinery gases and of natural gases, either by thermal, by catalytic, or by a combination of these methods, is technically and economically practicable, technologists say. It has been proved so by several units now operating, which combine polymerization of selected gases with hydrogenation of the resultant iso-olefins to iso-paraffins.

At least nine iso-octane plants are now operating or building in continental U. S. The Shell interests have two units operating or operable, with two more building or soon to be under construction. In connection with this expansion, Shell has installed special fractionating towers at Houston and possibly elsewhere, for the segregation of butanes and other hydrocarbons, presumably either to produce bottled gas or as charging stock for polymerization-hydrogenation operations. Shell has been so far one of the two suppliers of 100 octane number fuels, Standard of New Jersey being the other.

Standard Oil Co. of New Jersey has been operating one hydrogenation unit, and is now building, or about to start building two others. One of these is at Baton Rouge (S. O. Louisiana), one is to be located at Bayonne and the other possibly at Houston (Humble), where heavy concentration of butane from natural gas is effected by reason of the raw natural gasoline from East Texas, which is sent down to Baytown unstabilized via pipeline. This natural is stabilized there, producing specification natural gasoline and butane and/or propane for any desired purpose. A thermal polymerization unit is now under construction at Baytown.

In addition to these seven units, Gulf Refining Co. is building one at its Port Arthur, Texas, refinery, reputed to be of 100 barrels per day capacity. So far as is known this unit also is a polymerization-hydrogenation unit to operate on cracked refinery gases, of which that refinery doubtless produces a large quantity. Standard Oil Co. of California is also planning to build an iso-octane unit, but details are not available.

These nine units are our present sources of iso-octane, which is the most promising material from which to blend 100 octane number aviation fuels at present. But in addition to these iso-octane units, more than 20 polymerization units, mostly non-selective (that is, operating on mixed olefin or paraffin gases), are operating or building in this country.

Eight thermal gas cracking-polymerizing units are in use or soon will be; Phillips has four at Borger, Texas, and a fifth, we understand, near Kansas City, Kans., operating on refinery or natural gas or both. Humble has a thermal polymerization unit nearing completion at Baytown, Texas, where it operates a refinery. Atlantic has two of a combined 3000 barrels of finished polymer per day, at Atreco, Texas, and at Philadelphia. These eight have a polymer capacity of more than 10,000 barrels per day, according to the companies' estimates.

Using the Pure Oil polymerization process, two units, not including that of Carbide and Carbon Chemicals Corp., have been operating at least part of the time for some years. A third unit of this type will soon be under construction in California for Associated Division of Tide Water-Associated Oil Co. These operate on refinery cracked gases but could be applied, it appears, to paraffinic gases as well. Of Universal catalytic polymerization units, ten or more are operating or building in this country, including one or two iso-octane plants using polymerization catalysts, with a finished polymer capacity which may range from 10,000 to 20,000 barrels per day.

In our present knowledge of producing 100 octane number fuels, these polymeri

[1] Value of Octane Numbers in the Air, by D. P. Barnard, N.P.N., March 31, 1937, page 65.

[2] "Air-Cooled Radial Aircraft-Engine Performance Possibilities," Raymond W. Young, S.A.E. Transactions, June, 1936, p. 234.

[3] "Future Possibilities of 100-Octane Aircraft-Engine Fuel," Lieut. F. D. Klein, J. Soc. Auto. Eng'rs., 39, 304 (1936).

Dubbscracking week

It was home-made gasoline week in Montana August 1 to 7—by the governor's proclamation

They make more gasoline in the state now than they import—that's why they are celebrating—a year ago it was the other way 'round

In the first half of 1937 Montana refiners made 35 million gallons while 28 million gallons were brought in from outside

Dubbscracking produced 31 million out of the 35 million gallons of Montana-made gasoline

So it's really a Dubbscracked gasoline celebration

If automobile engines could talk, every week would be Dubbscracked gasoline week

In every state

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Facts about the submersible drilling barge

The cost of drilling wells in shallow water and marshland from a submersible barge is substantially less than that of other methods.

A single submersible barge has drilled 19 deep wells in less than four years.

Wells exceeding 12,000 feet in depth have been drilled from submersible barges.

The time required to shift location is reduced to a matter of a few hours.

Permits drilling with no pollution of water.

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zation units are potential refineries for producing that type of fuel, *if and when* the demand requires it. The "if" has become a practical certainty; but just when the demand will become great enough to warrant their conversion to iso-octane units cannot be stated with as much certainty. Hubner[4] and collaborators state that, within three years, U. S. military services will be converted to this grade of fuel entirely and that commercial aviation will be using it for take-off and special flights purposes. It is possible that estimated time may be foreshortened somewhat.

With the present and projected iso-octane capacity, however, it is not likely that American aviation demands, military and commercial, will require any more capacity, for some years at least. Trans-Atlantic air service will doubtless give a boost to the demand for 100 octane number fuels; in such service the longer cruising range given by the more efficient fuel will be worth a considerable premium in price. Shell's capacity alone is reputedly sufficient to supply all American demands even if all aviation is converted to use this grade of fuel. How fast demand will increase none can say.

Practically speaking, the supply of raw material is nearly unlimited. Buc and Aldrin[5] estimate a total possible yield of 155,000,000 gallons of iso-octane per year, presumably basing the estimate on the raw gases available at refineries alone. Egloff[6] estimates more than a million gallons per year potential based on the butane and iso-butane in natural gas which is available for processing.

Whatever this actual figure may be, the concentrations of butane and iso-butane in the East Texas and the Panhandle casinghead and natural gas areas are ample to supplement any shortage that might possibly occur in refinery cracked gas supplies. East Texas is estimated to yield as much as 300,000 gallons of butane per day, the Panhandle 700,000 gallons, a million gallons in those two areas, where concentration is such as to make the processing economical.[7] With a conservative 35% yield estimate, this would produce 350,000 gallons per day of blending material.

From these figures and many other estimates which might be quoted, it is readily seen that no dearth of raw material exists, or is likely to exist at any time within a decade or more; it is just as unlikely that any shortage will be felt in 1947. By that time entirely synthetic fuels may be practicable.

Another promising source of high octane number fuels is di-isopropyl ether, produced semi-commercially now by Standard Oil Co. of New Jersey at Bayonne. Made from propane or propylene, from refinery still gases, the plant capacity can be expanded in a relatively short time to meet any requirements, officials say. The amount of propylene available in refinery cracked gases is difficult to estimate, but in the larger plants, where the amount of gas produced is sufficiently large to warrant building units, the production could easily reach several thousand barrels daily, if the need arises. In addition, it has been calculated that East Texas natural gas alone will supply 400,000 gallons or more of propane for cracking to propylene. Texas Panhandle can supply three times that amount, if necessary, for the same purpose.

So much has been written and spoken of the manufacture and use of iso-octane as aviation fuel par excellence that too little attention has been paid, apparently, to the isolation and use of isopentane, derived from natural gas, as a blending agent for the same purpose. With an octane rating of 90, isopentane can be used to give a higher volatility to blends with iso-octane. The amount of isopentane available by fractionation of natural gas and refinery hydrocarbons is estimated at 190,000,000 gallons annually[8]. The properties of isopentane will be discussed later in this article.

Another excellent source of high anti-knock blending agents is the aromatics-benzene, toluene, xylene, ethyl benzene, to mention some which have been tested[9]. These materials are most essential as raw materials for explosives and chemical warfare products, in case of emergencies, and the present source—coal tar—will be called on to supply those needs primarily. But these products, especially benzene and toluene, can be produced in huge quantities from petroleum, as is evidenced by the early findings of Rittman's ahead-of-his-time researches in 1917 and on up to the results of Wagner and his collaborators[9].

Operating on refinery residue gases at 1200°F., Wagner and collaborators show a yield of nearly 75% of aromatics, including 25% benzene, 32.5% toluene and 16% xylene. By properly controlling polymerizing temperatures, these authors find that the aromatic production can be controlled to show large yields of aromatics from the huge quantities of refinery gases available. This potential production could be used both to supply raw material for primary war materials and for aviation fuels as well. Egloff[9] estimates that, in 1935, more than 50 billion cubic feet of refinery gases were produced which could be polymerized. With more than a gallon of aromatics per 1000 cu. ft. of charge gas, this would produce the huge total of 50,000,000 gallons of these three aromatics per year as potential yield, in case need for them arises.

Many other products can be made from refinery gases, such as ethers, alcohols, ketones, etc. These oxygen-containing materials have a correspondingly lower total heat content than the hydrocarbons from which they are derived, and thus a lower power efficiency, weight for weight, or volume for volume; but some of them have advantages of volatility, anti-knock rating and other properties which may make them desirable in emergencies.

Properties of Fuel Components

The basis for most of the 95-100 octane number fuels used at present is technical iso-octane, made by polymerizing iso-butylene from still gases to di-isobutylene and hydrogenating to iso-octane. By definition, pure iso-octane is rated at 100 octane number. In commercial production Hubner[4] points out that higher practicable yield sometimes make it more desirable to produce 90 or 95 octane number iso-octane than to make the 100 rating material. The 90 and 95 octane number product can be raised to 100 octane

[4]"Aircraft Fuel Specifications—Present and Future", By W. H. Hubner, Gustav Egloff, and G. B. Murphy; N.P.N., XXIX, R-57 (1937).

which is available for processing.

[5]"New Blending Agent, etc."; Buc and Aldrin, N.P.N., June 17, 1936, page 25.

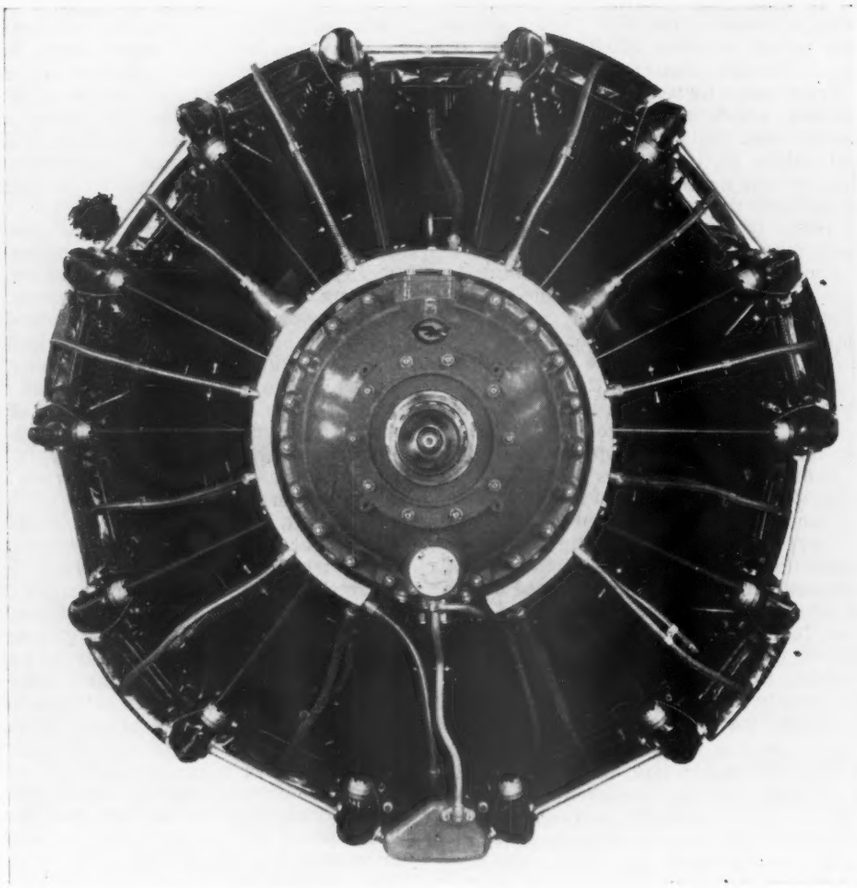
[6]"Polymerization, etc."; Gustav Egloff, N.P.N., Nov. 20, 1935, page 25.

[7]"Polymerization Applicable to Natural Gas, etc."; N.P.N., April 22, 1936, page 43.

[8]"Isopentane Has Major Role In Making 100 Octane Number Aviation Fuels"; Neptune, Trimble and Alden, N.P.N., May 6, 1936, page 25.

[9]"Products of Polymerization"; by Ridgway, Wagner and Swanson, N.P.N., Nov. 4, 1936, page 47.

U. S. Army's new experimental multi-seater fighting plane, equipped with radio, disappearing under-carriage and what appears to be heavy caliber quick-firing guns. Official photograph, U. S. Army Air Corps



Pratt and Whitney two-row, 1400 hp. Twin Hornet engine, which will use 100 octane number fuel. It will power many of the new commercial and military planes soon to go into service

number by the addition of 1.0 cc. and 0.4 cc. respectively. Because of its low vapor pressure, iso-octane alone is not the best product for a fuel; it is blended with a higher vapor pressure but lower octane number naphtha or gasoline, frequently 70-72 material in about 50-50 proportions, to yield an 80-85 octane number product which is 'leaded' to 100 octane number. Three cubic centimeters of lead will raise a 50-50 iso-octane-70 octane number straightrun blend to about 93 octane number Motor Method, which corresponds to about 98-100 octane number Army Method.

This situation may be simplified somewhat by blending iso-octane of 90 to 100 octane number with isopentane. The latter has a vapor pressure of 20.4 lbs. Reid,' octane number of 90, and boiling point of 82.3° F. Iso-octane boils at 211° F., with 2.2. pounds vapor pressure, too low for convenient use in aviation engines. A 50-50 blend would produce a fuel with around 11 pounds vapor pressure, still too high for present specifications; redesigning of present fuel systems would do much toward permitting this pressure to be used in tomorrow's airplanes. With such a blend only a fraction of a cubic centimeter of 'lead' is needed to reach 100 octane number, or, with the maximum permissible quantity of lead, it will give a fuel of 110 octane number or higher.

The first fuel, with the minimum of lead, will satisfy the Army, Navy, and those users who object to the corrosion which is claimed to result from the use of large quantities of lead at the high operating temperatures. The above 100 rating, with considerable amounts of lead, will please others who have found, they state, that the heavily 'leaded' fuels, of the same test rating as unleaded fuels, will show better performance than those without lead or with only small percentages of lead. One of the large engine manufacturers believes this is the case and is specifying fuels of 100 octane number, for a certain model engine, which contain nearly the maximum permissible lead content.

A 50-50 blend of isopentane and 70 octane number gasoline, with three cc. of lead gives about 96 octane rating; the vapor pressure of this product can be controlled by the vapor pressure of the gasoline used for blending; the octane rating can be brought to 100 by using gasoline of 74-75 octane number, or by including a small percentage of isobutane of 99 octane number.

Iso-propyl ether has an octane rating somewhat higher than iso-octane, comparative test results show; its "octane number blending value" is also somewhat higher than iso-octane[10]. This ether boils at 154° F. and, when blended with iso-octane and/or aviation gasoline, it aids in offsetting the tendency of iso-octane to make the upper distillation range heavy.

One disadvantage of iso-propyl ether is that its heat content is lower than hydrocarbons comparable with it in other ways. Its B.t.u. content is 15,600 as compared to 19,200 for iso-octane and 17,000 for benzene. It has been found by test, however, that the consumption of a 40% blend of the ether in aviation gasoline (18,120 B.t.u./lb.), was 6% to 8% higher than for gasoline (19,550 B.t.u./lb.), of the same 100 octane number. In practice when richer mixtures are used, engine test runs show that the ether fuel consumption becomes as low as that of the hydrocarbon fuel, due doubtless to difference in combustion characteristics of the two fuels. Although no exact values have been determined experimentally, the authors referred to above believe that a fuel such as an iso-propyl ether blend, having only 92.5% of the heat value of a hydrocarbon fuel, should have about 105 octane rating to equal a 100 octane rating hydrocarbon gasoline.

Toluene, the xylenes, and ethylbenzene have boiling points as follows:

Toluene, 231° F.; O-Xylene, 291; m-Xylene, 282; p-Xylene, 280; and Ethylbenzene, 277.

All these products show higher than 100 octane number, except ethylbenzene with a 96 rating determination of exact octane ratings above 100 is indefinite, since neither scale or methods have been developed for such ratings. However, the lead susceptibility of these hydrocarbons is such that a 50-50 blend with 70 octane number gasoline, showing 79 to 85 octane number without lead, will show ratings of 84 to 95 with three cc. of lead, according to the A.S.T.M. Motor Method. They may be thought of as emergency fuels but may become useful as blending agents.

New Aviation Engines

Both Wright Aeronautical Corp. and United Aircraft Corp. (Pratt and Whitney) are bringing out engines which require 95-100 octane number fuels. The Pratt and Whitney new Twin-Wasp engines are designed for 87 octane number, rated at 1000 hp. at 2600 r.p.m. for take-off. This engine has 14 cylinders in two rows, with three-piece crankshaft and two master connecting rods, one for each bank. The same company is bringing out a 1400 hp. Twin Hornet 14 cylinder, two-row engine, using 95 octane number (100 by Army Method) fuel, which is being placed in the new 30-ton Douglas DC-4 plane, which is being built for five major airlines. Each plane will use four of these engines. This will give a take-off power totaling 5600 hp., and about 4600 hp. at cruising engine speed of 2350 r.p.m. United Airlines, American Airlines, Transcontinental & Western Air, Eastern Airlines and Pan-American Airways are the companies which will soon be using these planes, according to announcements. Superchargers may be used on these engines, it is understood.

Similarly, Wright Aeronautical Corp. has developed a Cyclone line of engines, the most recent of which is understood to turn up 1400-1500 hp. and is a 14-cylinder, two-row design. Both the engines referred to are 6.5:1 compression ratio, and can be equipped with superchargers, reports say.

Transcontinental and Western Air, and American Airlines are reported to be studying the operation of these new engines in test planes, to determine their efficiency and optimum operating conditions. American has used 93 octane number fuels, presumably A.S.T.M. Motor Method rating, experimentally in the huge Douglas DST Sleeper Flagships

(*Continued on page* 46)

[10] "New Blending Agents, etc."; Hoffman, Lapeyrouse and Sweeny, World Pet. Congress, June, 1937.

ADVERTISING PAGES REMOVED

This new station of the Tide Water Oil Co.'s Associated Division in Los Angeles was designed to attract business from a six-lane roadway, Wilshire Blvd., which carries traffic between the city and the western suburban districts. The tower is illuminated by Neon tubing, in red and yellow, in recessed steps below the "Flying A" insignia. The station features a display for automobiles

Building a Station to Pull Trade From Six-Lane Highway

By JACK N. WESTSMITH
N. P. N. Staff Writer

SERVICE station construction along Wilshire Blvd. reflects the growing importance of that arterial connection between Los Angeles and its suburban residential districts to the west; a connection referred to by some southern California boosters as the "Great White Way of the West."

Because it offers practically a continuous line of traffic, this six-lane avenue has received more than average consideration by oil marketing companies in this area for service station locations and strategic corners present many outstanding examples of specialization in construction and design.

However, the very characteristics of motor travel over this roadway call for careful analysis of the ability of a retail outlet to pay out, in the face of high land values and costs of constructing a unit which will meet exacting building restrictions and blend with improved business and residential areas along the way.

An important factor in this consideration is that traffic along Wilshire—either toward or away from the city—is always in a hurry. This means that a station must be located and built with an eye to visibility for a considerable distance in either direction, so that the motorist, upon spotting the identifying sign, can swing easily and safely to a stop beside the pump islands.

Experience has indicated that the best locations for stations along this roadway are at intersections where stop and go signals regulate traffic flow. The favored corners as usual are, those on the approach side of the intersection—offering entrance in and out of the station yard from the same street without crossing traffic.

However, corners across the intersection have been improved by placing the sales room and pump islands back from the corner so as to permit in and out approaches from the same street.

This is not a story of Wilshire Blvd. but of a new retail outlet recently built by Tide Water Oil Co.'s Associated Division on that boulevard; a station that illustrates modern methods of design and construction for locations where quality of merchandising layout, rather than cash outlay, is the determining factor.

Associated's engineering staff holds closely to the belief that careful preliminary planning determines the success of service station operation. The company has standardized on arrangement and construction details as a means of giving its dealer-operated outlets "institutional identification," but it has used special designs with success in favored locations.

Its unit on the northeast corner of Wilshire and Norton avenues is an example of these "special" type stations. It was built to combine complete service station sales and service departments with a distinctive display room for Ford and Lincoln automobiles. The station is operated by Bill Froelich, dealer for these cars on this west side of Los Angeles.

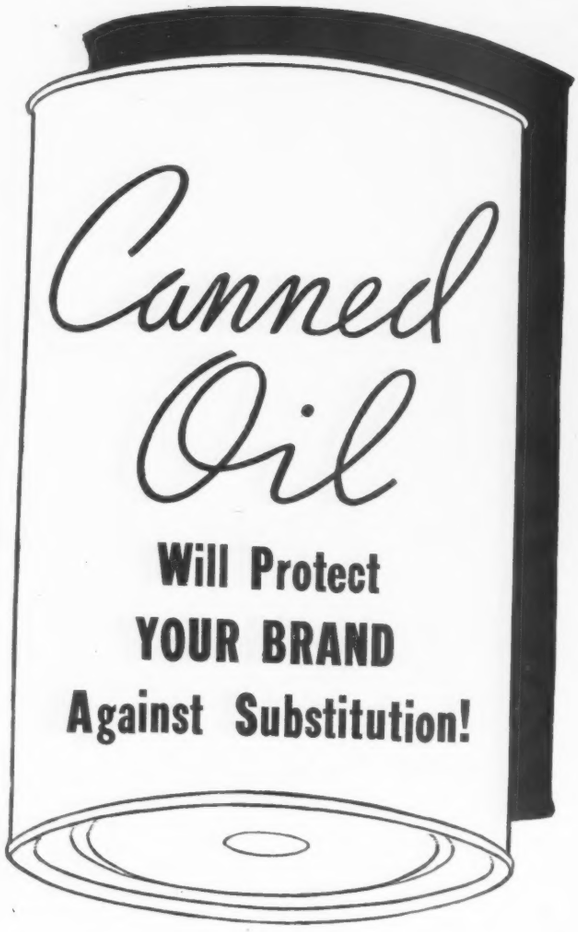
Accompanying photographs and a detailed plan view illustrate the manner in which the glass enclosed display room is built into this station design, and how the arrangement was made for including the service departments as an integral part of the layout.

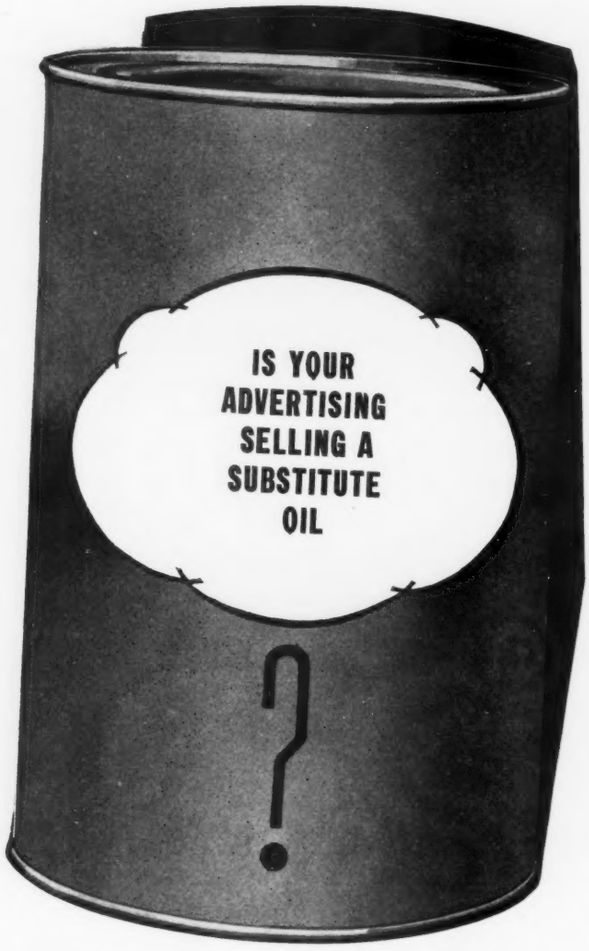
The station building is all steel and glass construction. A 16-gauge metal sheeting is used and painted by the company to its color specifications. An important feature of the construction is the elimination of a separate roof and ceiling over the building and canopies.

A self-supporting roof deck is used, which utilizes 16-gauge sheeting pressed into shapes that fit together to form a combination roof-supporting purlin and cover sheet. This construction affords an unobstructed ceiling which can be painted to high luster and reflect the maximum in illumination.

This station makes its strongest bid for

HEEKIN *Oil* CANS





What "cans" have done for Motor Oil can be done for Hypoid Gear Lube. There is a growing realization that the modern profitable merchandising of oil and lubricants necessitates their being packaged in colorful, attractive, lithographed cans. Motor Oil in cans has paved the way. Next in line is Hypoid Gear Lube.

HEEKIN Cans are noted for their true, lasting reproduction of colors. Vigorous reds, greens, blues—pure white—any color of the rainbow. For years Heekin Cans have shouted a sales message to customers in groceries and drug stores, bakeries and confectioneries, hardware stores and paint stores. If you are now canning oil, or planning such a program, let us tell you about Heekin Lithographed Cans with harmonized colors—let our designers work with you—let us be of assistance. Write THE HEEKIN CAN COMPANY, Cincinnati, Ohio.

THE HEEKIN CAN COMPANY · CINCINNATI · OHIO

business from west-bound traffic and has two, three-pump, canopy covered islands to serve motorists wishing to swing in or out from Wilshire on that side. Another three-pump island, with a shorter canopy, serves the less important cross street. The curve glass car display window is framed between the two canopies. All pumps are of the computing type.

While the primary business of this combination resale outlet is the merchandising of petroleum products and automotive accessories and services, every inducement is offered the motorist and his passengers to get out and look at the automobile and other merchandise on display.

ONE of the inducements is an ice-cooled, soft drink cabinet. Although the profit from a case of assorted beverages sold a day will not pay the rent, or even the utilities, the drink sales do provide an incentive for the customer to make a closer inspection of the station and its facilities, it has been found.

An attractive leather divan is placed in the sales room for the convenience of customers waiting for a car to be serviced. Of course this divan is located near the car display—another indirect effort to gain interest in that direction. Loafing on the soft seats of this divan and in fact around the station, by those with no definite purpose, is discouraged.

The service station operators do not attempt to close the sale on a car. If the prospect seems really interested, his name and address is passed on to the regular salesman for a follow-up. If the prospect becomes a sale the service station attendant receives a commission. The station has been responsible for the sale of 15 cars since its opening three months ago.

Perhaps above everything else, the success of this station may be traced to the service offered. Every car coming to the pump islands is dusted off—unless the driver indicates he is in a hurry and does not want this service—every window is

Flowers and attractive girls marked the recent opening of the new service station-car dealer outlet of the Tide Water Oil Co.'s Associated Division, on Wilshire Blvd., in Los Angeles. The short canopy over the single island features a cantilever construction. Note the flashlight carried in a clip attachment on the center pump's discharge hose, ready for instant use

cleaned, the floors are cleaned with a hand vacuum (quick-coupled to an air hose), and the battery and tires checked.

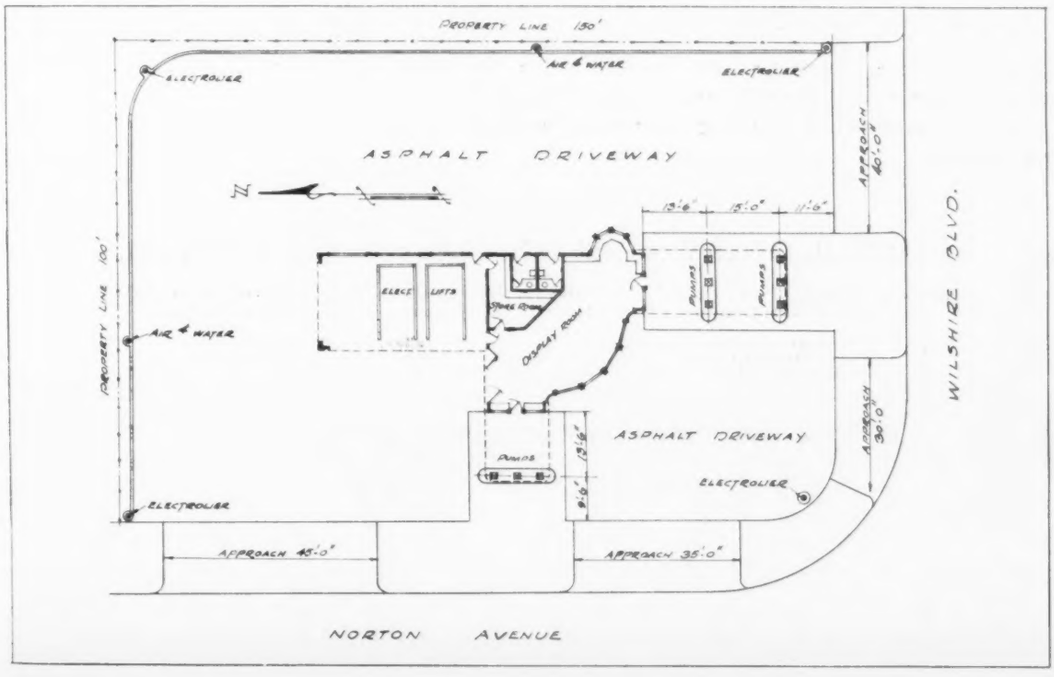
This free service is speeded by locating all necessary facilities on the island. Air and water hoses are in wells at the end of each island to expedite service to cars on either runway. The hand vacuum, dust cloths and windshield cleaning cloths are carried in an attractive circular stand, made of metal and painted green to conform with the station's color scheme. Each island is equipped with one of these racks.

About two dozen dust cloths are used a week at the station, according to Al Birdsall, manager, but he says the service has proved most successful as a customer builder. This is illustrated by an analysis of station sales. From a start of 10,000 gallons of gasoline a month, sales averaged an increase of about 1000 gallons for each of the first three months and are still on the upswing.

A proportionate improvement was made in sales of other products and services. A pick-up and delivery motorcycle service is maintained by the station in going after lubrication business within a distance of a mile and a half. Although this department is usually slow in developing, the station is exceeding 100 lubrication jobs a month.

Another reason for the strength in back-end sales is the attractive and well equipped lubritorium. The three-bay service department affords room for two electric lifts, a complete pressure lubrication display unit, a battery recharger, spark plug cleaner and additional space for minor repair work.

Displays of fan belts and tires have been located in the service wing where



Ground plan of Tide Water Oil Co. Associated Division's new combination car dealer and gasoline service station on Wilshire Blvd., in Los Angeles

they can lend themselves as selling arguments for replacements. Night lubrication is featured at the station and is facilitated by the installation of flood lights in the cement floor under the lifts.

Accessories, including car repair parts, are important in the sales program of this station. Exclusive of tires, the monthly take on accessories is about $300. Among the unusual accessory items not generally found on the shelves of a service station, are charcoal briquets and charcoal broilers. The briquets sell for 25 cents a bag and the station averages 6 to 8 a week. Two sizes of broilers are carried; one that sells for $1.85 and another for $2.25. During the warm outdoor months, the station features window displays of these items.

Inside the main sales room are three accessory racks on casters. They are three feet wide, four feet long and four feet high, having, in addition to the top display shelf, six rows of six compartments each on two opposite sides.

In addition to a large assortment of Ford parts, these stands carry the display of spark plugs, waxes and polishes, oil filters, dust cloths, top dressing, tube repair kits, windshield wiper blades, radiator bug screens, seat covers, and other small accessory items.

No discussion of an Associated station would be complete without mention of the rest rooms. Not that there is anything startling about their appointment, but because this company has been particularly active in impressing on its dealers the importance of cleanliness in this and other departments of service station operation.

Its dealers are organized under a Certified Clean Comfort Station program, in which membership and the right to display the C.C.C.S. sign depends upon the clean and sanitary condition of the rest rooms.

At the Wilshire and Norton station, the rest rooms are conveniently located at the rear of the main sales room. On a nail over the wash basin hangs a sign in which the operator makes a bid for the rest room "customer's" business in a manner designed to impress the fact that the operator is at some expense to maintain the rest room service. The sign also helps impress the operator with the need for keeping his comfort facilities, and his station clean.

Ethyl Export Officials Named

New York—Thomas R. A. Bevan has been elected a vice-president of the Ethyl Export Corp., foreign subsidiary of the Ethyl Gasoline Corp. Mr. Bevan will continue as manager of the London office of Ethyl Export, a post which he has occupied for the past ten years.

Francis Rodwell Banks has been named assistant secretary of Ethyl Export. He has been in charge of the technical work of the export corporation since 1930.

Super Fuels

(*Continued from page* 40)

with Wright G-2 engines, out of Glendale, Cal. Here the higher octane number fuel has been used for take-off and emergency purposes, and constant-speed propellers are used. The new 1400 hp. engines will doubtless use variable-speed propellers.

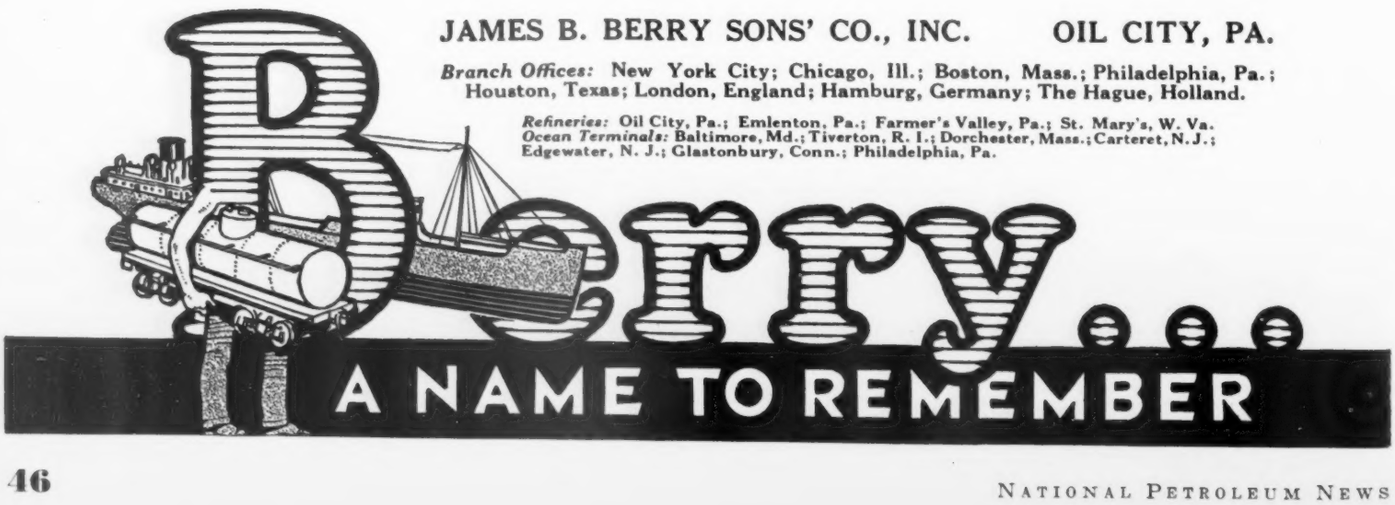
One airline reports, "The 93 octane (number) fuel appears practicable, with the exception that the deposit of lead has been aggravating." This is at variance with the opinion of one engine maker, who believes that a near-maximum of lead is desirable for practical performance results, given the octane number laboratory test rating of leaded and unleaded fuels.

As to consumption of higher octane number fuels, one company estimates that 3,000,000 gallons of 90 octane rating aviation gasoline will be used during the year ending June 30, 1938. Another will probably consume as much, which with the estimated amount to be used by other lines will make the demand for this grade of fuel from the commercial air lines somewhere between 8 and 12 million gallons during that period. It is yet to early to estimate the requirements of 95-100 fuel for new fleets now building, which will soon be in service.

KEROSENE

There is a decided difference in what is commonly called Penna. 45-46 gravity Kerosene. All materials supplied by Berry's are water white in color, both treated and filtered, and possess a distillation range which assures even burning qualities.

Kerosene Distillate, Furnace and Fuel Oils are available from our Penna. refineries and seaboard terminals. We ask that you favor us with your inquiries when placing your requirements for the coming heating season.



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Twice-A-Year Oil Change—Trend Or Passing Fad

By JOHN W. THOMPSON
N. P. N. Staff Writer

IT IS needless to say that the oil industry is not exactly in sympathy with the attitude of some car manufacturers toward oil change periods.

In fact, the oil industry has set up an Oil Change Committee whose fundamental purpose is to educate the motoring public on the need for frequent oil changes. And it would be unjust to say that this committee has not been doing its work well. It has prepared a list of very logical reasons why oil should be changed regularly and at frequent intervals.

But unfortunately, the automotive industry does not think along the same lines. The car manufacturer is interested in selling cars and in developing more reasons why the public should buy his car. One of his prized "handles" is the appeal of economy and low up-keep. He can point out how his car uses less gasoline than his competitor's does. And if he finds that it is possible and practical, from an engineering standpoint, to emphasize to the prospect that his car will run longer without an oil change, then that is another sales point.

And being a sales point, it will be used and promoted and, if it does not happen to tie in with the promotional efforts of the oil industry, it is just unfortunate—for the oil industry.

When the 1937 Studebaker was announced publicly, prior to the New York Auto Show in Nov., 1936, the instruction books on this car carried the following information:

"It is recommended that the oil be changed after the first 500 miles of car operation. Following this change, if the oil filter cartridge is replaced at proper intervals, the only changes necessary are those required to meet seasonal conditions."

To the public such a claim was something which lent favor to the Studebaker, but to the oil industry it was downright sacrilegious. The Studebaker engineering department recalled that oil companies wrote in, loud in their opposition to the recommendation, pointing out the many reasons why the oil should be changed more frequently. Such reasons were listed as; dirt in the air and in the oil, decomposition, dilution, and water in the crankcase.

In back of this revolutionary oil change recommendation, of course, is an oil filter of the part-flow type, and containing a replaceable filter pack which is filled with about one pound of chemicalized cotton waste.

Not entirely sold on the part-flow filter, Studebaker did a considerable amount of experimenting on the full-flow type, but the cost of such a filter proved to be an obstacle. Then the part-flow filter which this company is now using was tried out for about two years. The results during this test period led to the filter being placed on the large 1936 Studebakers for field experience.

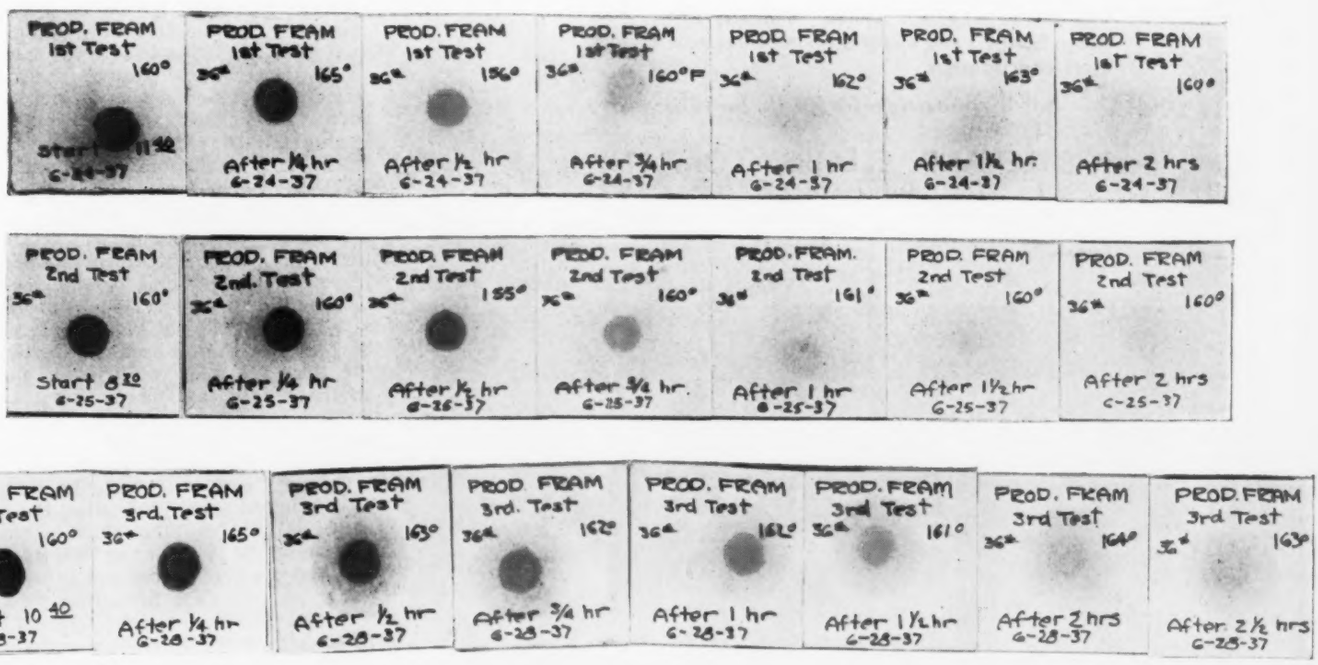
The success in the field during 1936 led to the adoption of the filter as standard equipment on all 1937 models.

Studebaker engineers make no radical claims for the filter, stating simply that it removes foreign particles from the oil and restores its color. They point out that oil men have tried to "scare them" from time to time with talk about the acidity, sludge, and gum-forming residue that develops in oils that are used too long. Their only comment in answer to these points is, "all we know is that we are having no trouble."

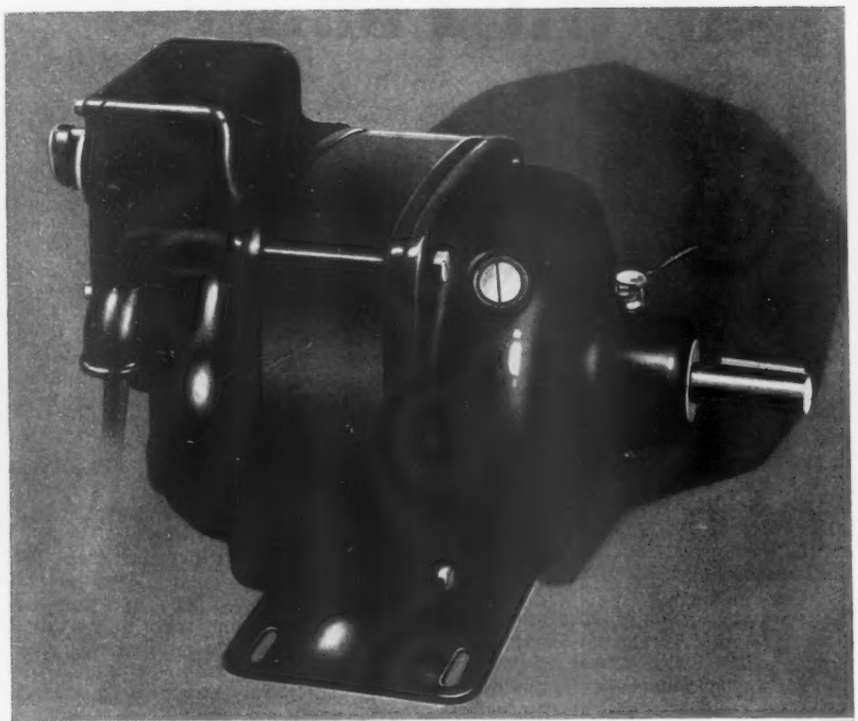
At the present time, at least, it is safe to say that acidity and corrosion are not within the scope of the oil filter to correct. It can also be said that certain oils have been known to attack some hard surfaced bearings before the oil has been run long enough for the filter to take effect in removing any foreign particles.

The cartridge in the Studebaker oil filter should be replaced, according to the instructions, when the word "clean" on the dip-stick gauge can no longer be seen. Other than that, it is recommended that the crankcase need be drained only twice a year, for seasonal changes.

In other words, the Studebaker owner


PROD. FRAM 1st Test 160°
Start 11 qt 6-24-37
PROD. FRAM 1st Test 165° After ¼ hr 6-24-37
PROD. FRAM 1st Test 156° After ½ hr 6-24-37
PROD. FRAM 1st Test 160°F After ¾ hr 6-24-37
PROD. FRAM 1st Test 162° After 1 hr 6-24-37
PROD. FRAM 1st Test 163° After 1½ hr 6-24-37
PROD. FRAM 1st Test 160° After 2 hrs 6-24-37
PROD. FRAM 2nd Test 160° Start 8 qt 6-25-37
PROD. FRAM 2nd Test 160° After ¼ hr 6-25-37
PROD. FRAM 2nd Test 155° After ½ hr 6-25-37
PROD. FRAM 2nd Test 160° After ¾ hr. 6-25-37
PROD. FRAM. 2nd Test 161° After 1 hr 6-25-37
PROD. FRAM 2nd Test 160° After 1½ hr 6-25-37
PROD. FRAM 2nd Test 160° After 2 hrs 6-25-37
PROD. FRAM 3rd Test 160° Start 10 qt 6-28-37
PROD. FRAM 3rd Test 165° After ¼ hr 6-28-37
PROD. FRAM 3rd Test 163° After ½ hr 6-28-37
PROD. FRAM 3rd Test 162° After ¾ hr 6-28-37
PROD. FRAM 3rd Test 161° After 1 hr 6-28-37
PROD. FRAM 3rd Test 161° After 1½ hr 6-28-37
PROD. FRAM 3rd Test 164° After 2 hrs 6-28-37
PROD. FRAM 3rd Test 163° After 2½ hrs 6-28-37

This group of three tests show the extent to which the Studebaker oil filter cleans the crankcase oil. The oil samples were taken from the crankcase at frequent intervals during the test run, and placed on blotting paper, as shown here. Note how each test begins with a dirty oil, and how it gradually clears up throughout its two hours of test operation



ANOTHER ONE FOR THE BOOK

After a lapse of ten years the Davis cup returns to America and we all say "great".

Here's another and a still greater achievement—for sixteen *consecutive* years the Leland gasoline dispensing line of motors has led its competition. No lapse here, not even for a day.

A baker's half-million sold. Only a fraction of 1% ever returned for service. Virtually all gasoline pump builders and major oil companies now Leland users and boosters.

For dispensing—for bulk handling

THE LELAND ELECTRIC COMPANY
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LELAND

does not change his oil at mileage intervals, but is governed by the appearance of the oil, and when the time comes for a change it is a change of filter pack instead of a change of oil.

Studebaker engineers report that it is not uncommon for a Studebaker to go 30,000 miles on the same oil, adding only enough to keep the level up and changing the filter pack when the dip-stick shows it to be dirty. Filter pack changes are reported to be made at varying mileages, depending upon the car and the oil, and range from 2500 miles to 10,000 miles.

Recently one of the large oil companies made a routine analysis of an oil which was run 22,300 miles in a Studebaker, which had passed through a new filter pack before testing. The oil company, not aware of the service the oil had given, pronounced it as "satisfactory" after making tests of it.

The tests on this 22,300-mile oil revealed the following properties: gravity, 221; flash, 255; pour, —15; viscosity at 100, 393; viscosity at 210, 52.3; acidity, 0.83 mg. KOH per gm.; naph. insol., 0.019 per cent; $CHCl_3$ sol., 0.018 per cent; and viscosity index, 31.

Tests made by Studebaker engineers to determine the time required for the filter to clear up a dirty oil were made by placing a drop of the oil on a piece of blotting paper at various intervals during the tests and noting the intensity of the blackness of the spot. Starting with a dirty oil, usually a diesel oil, and using a clean filter cartridge, it was found that the oil was practically free of foreign particles and restored to its former color within a period of 2.5 hours. Engine temperatures during these tests ranged between 155 and 165 degrees.

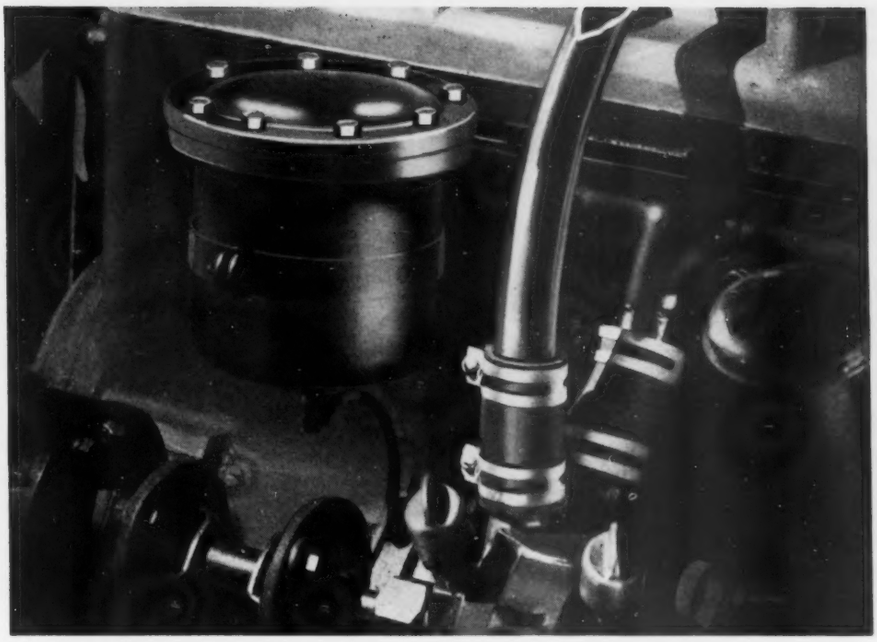
Additional tests were made to determine the length of life of the filter pack, and also to determine how far a car must be driven with a new filter pack before the oil is cleared.

One such series of tests covered 28,222 miles and required over two months time. During that test period it was found necessary to use five new filter packs, including the one used at the beginning of the test. This showed the average mileage per filter pack to be slightly over 5600 miles. The same oil was used throughout the entire 28,222 miles, additions being made only to maintain the oil level in the crankcase.

In most cases the oil showed a gradual blackening on the blotter sample, up until the final test before replacing the pack, at which time it showed to be definitely discolored. After putting in a new filter pack the blotter samples indicated that the oil became clearest after the first 100 miles of driving, and that slight traces of discoloring occurred around the 700-mile mark. The oil had definitely cleared, however, after 50 miles of driving with a new pack.

On the 28,222-mile test, the first pack was replaced after 7707 miles, the second after 6418 miles, the third after 6835 miles, and the fourth after 7020 miles. The test ended when the car had traveled only 242 miles using the fifth filter pack.

Studebaker is not alone when it comes to stretching the oil change period. Early in March of this year Lincoln-Zephyr announced it was equipping all of its cars with a similar make of oil filter. As a result, its oil change recommendations



The oil filter used on all 1937 Studebakers and on all Lincoln-Zephyrs produced since March, 1937, are of the full-flow type,and contain a replaceable filter pack made of a tightly compressed and chemicalized cotton waste. A Studebaker installation is shown here

state that oil in new cars should be changed after the first 300 miles of driving, and thereafter EVERY 5000 MILES. This company further stipulates that the oil filter cartridge should be replaced every 8000 miles.

Graham has been using this type of filter as standard equipment on its supercharger models and as optional on the Cavalier model for about a year and present indications are that this practice will be continued and possibly extended next year. One Graham engineer reports that, although an oil change is recommended by his company every 5000 miles on cars equipped with this filter, "it is not necessary to change the oil at all if the cartridges are replaced when the oil appears dirty."

Although these car manufacturers do not by any means represent a major part of the new car registration—their combined 1937 production to date is near 100,000 units—they are an indication of the way the wind is blowing. It should be remembered that Lincoln-Zephyr is a blood relation of Ford and that, if the latter should put on such a filter, the oil industry might be noticeably disturbed.

Refinery Engineering Papers Listed For Houston Oil Show

HOUSTON, Aug. 23.—A conference on refinery engineering will be held Oct. 15, during the Oil-World Exposition following the two-day meeting on refining measurement and control. The exposition takes place here Oct. 11 to 16.

Tentative papers on that program are:

"Thermal Polymerization and Its Utilization by Refineries," by P. C. Keith and J. S. Carey, M. W. Kellogg Co., New York.

"Manufacture of Organic Chemicals from Petroleum and Natural Gas by Polymerization," by Dr. M. C. Cooke, Alco Products, Inc., and Dr. C. R. Wagner, The Pure Oil Co., Chicago.

"Catalytic Polymerization and Its Application to Refining," by Dr. Gustav Egloff, Universal Oil Products Co., Chicago.

"Combination Selective Cracking," by Dr. E. R. Smoley, The Lummus Co., New York.

"Alloy Tubes for Modern Refining Processes," by Dr. H. D. Newell, chief metallurgist, Babcock & Wilcox Tube Co.

"Metallurgy in Petroleum Refining Equipment," by E. S. Dixon, The Texas Co., New York.

"Gasoline Treating and Sweetening Processes," by Dr. C. W. Rippie, Solvay Sales Co., New Orleans.

"Extraction of Salts from Refinery Stocks by the Electrical Process," by T. N. St. Hill, president, Petroleum Rectifying Co., Los Angeles.

New Solvent Standard

WASHINGTON — Commercial Standard CS3-38 for Stoddard solvent will become effective Feb. 10, 1938, it is announced by the National Bureau of Standards. Revision to Standard CS3-28 was circulated for approval Jan. 12. An amendment with reference to a 50% point distillation requirement was circulated June 11 and has been approved.

The requirements for the distillation range as they now stand are as follows. When a sample is distilled in accordance with paragraph 22, not less than 50 per cent shall be recovered in the receiver when the thermometer reads 350° F. and not less than 90 per cent when the thermometer reads 375° F. The end point (maximum distillation temperature) shall be not higher than 410° F.

OIL MARKETERS

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Wholesalers — Retailers

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IN CONNECTION WITH ITS

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AT THE

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October 12 - 13 - 14, 1937

(Guests are further extended an invitation to attend the Convention Sessions where addresses will be delivered by persons of national prominence).

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The word ESSO is "A sign of service and a symbol of quality"

ESSO—for Premium Motor Fuel ESSO MOTOR OIL—for Premium Motor Oil
ESSOLENE—for Regular Motor Fuel ESSOLUBE—for Regular Motor Oil

New Patents

Compiled by R. E. Burnham, patent and trademark attorney, 511 Eleventh Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

June 29, 1937

REFINING

Method of producing low boiling hydrocarbons—William O. Keeling, Independence, Mo. Filed June 7, 1929. No. 2,085,027.

Still for renovation of used oils—James F. Bellinger, La Fayette, Ind., assignor to Scientific Oil Corp., Indianapolis, Ind. Filed Aug. 28, 1935. No. 2,085,069.

Amplified distillation—James R. Bailey, Austin, Tex., assignor to Union Oil Co. (Calif.). Filed Apr. 8, 1935. No. 2,085,287.

Processes for breaking petroleum emulsions—Melvin De Groote and Arthur F. Wirtel, St. Louis and Kirkwood, Mo., assignors to Tretolite Co. Filed Sept. 18, 1936. Nos. 2,085,298, and 2,085,299.

Method of distilling oils—Fred L. Fast, Woodbury, N. J., assignor to Socony-Vacuum Oil Co. Filed Dec. 4, 1935. No. 2,085,422.

Process for manufacturig motor fuels—Malcolm P. Youker, Bartlesville, Okla., assignor to Phillips Petroleum Co. Filed Dec. 7, 1931. No. 2,085,623.

REFINING AND MISCELLANEOUS

The following to Shell Development Co. as assignee of the inventors:

Process for preparation of mudflush—Pieter van Campen, Amsterdam, Netherlands. Filed Jan. 25, 1934. No. 2,085,517.

Process for refining mineral oil—Willem J. D. van Dijck. The Hague, Netherlands. Filed Feb. 18, 1935. No. 2,085,518.

Method of treating mineral oils—Cedric G. Verver, Amsterdam, Netherlands. Filed July 30, 1935. No. 2,085,519.

Continuous dewaxing process and apparatus—Alvin P. Anderson, Wood River, Ill., and Chever M. Kellogg, University City, Mo. Filed July 23, 1934. No. 2,085,521.

Apparatus for fractional distillation—Gerrit Baars, The Hague, Netherlands. Filed Nov. 1, 1934. No. 2,085,522.

Sweetening process—Arnold Belchetz, Houston, Tex., and Bernard R. Carney, Hartsdale, N. Y. Filed May 9, 1935. No. 2,085,523.

Polymerization of olefines—Martin de Simo and Frederick B. Hilmer, Berkeley, Calif. Filed July 12, 1935. No. 2,085,524.

Process for stabilizing polymers—de Simo and Hilmer. Filed Nov. 8, 1935. No. 2,085,525.

Process for treating mineral oils—Spafford M. Gregory, Long Beach, Calif. Filed Apr. 19, 1935. No. 2,085,527.

Lubricating greases—Edwin M. Klemgard, Matinez, Calif. Filed May 5, 1934. No. 2,085,533.

Soap for manufacturing lubricating greases—Klemgard. Filed Feb. 20, 1935. No. 2,085,534.

Process for polymerization of unsaturated hydrocarbons—Siegfried L. Langedijk and Adrianus J. van Peski, Amsterdam, Netherlands. Filed Jan. 4, 1936. No. 2,085,535.

Process for refining mineral oils—Edmond R. P. E. Retailliau, Wood River, Ill. Filed Nov. 2, 1935. No. 2,085,545.

Distillation process—Petrus J. Roelfsema, Walnut Creek, Calif. Filed Mar. 20, 1935. No. 2,085,546.

MISCELLANEOUS

Inhibitors for lubricating oils—Raphael Rosen, Cranford, N. J., assignor to Standard Oil Development Co. Filed Dec. 27, 1933. No. 2,085,045.

Railway tank car—Isaiah C. Davis, Berwick, Pa., assignor to American Car & Foundry Co. Filed Jan. 11, 1934. No. 2,085,419.

Treating liquid partial oxidation products, and treatment of oxygen derivatives of hydrocarbons in which aluphatic hydrocarbons predominate—Filed May 31, 1921, and Mar. 26, 1924. Nos. 2,085,499 and 2,085,500.

Liquid distributor (gasoline pump type)—Socrates Baiesi, Buenos Aires, Argentina. Filed Sept. 12, 1935. No. 2,085,567.

Preparation of mineral white oils and products prepared therefrom—Philip J. Byrne, Jr., Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Apr. 20, 1933. No. 2,085,693.

On the Lazy Bench

Wife: "Did you have a hard day at the office, dear?"

Mr. Begtostate: "In reply to your query of even date as to my day at the office, regret to say that business matters were pressing, and I am very tired."

Wife: "Your poor dear, well, come on now dinner is ready."

Mr. Begtostate: "In re your statement concerning immediate preparations to serve dinner beg to advise that it will be five minutes before I can act on this, owing to the fact that I have just lighted a cigar. Regretting my inability to comply promptly with your request, and trusting that the delay will not seriously inconvenience you—"

Wife: "Lay down that cigar and come to dinner at once! It's getting cold."

Mr. Begtostate: "Your complaint regarding delay in attending to your recent order has been called to my personal attention, and I beg to assure you same will receive immediate handling. Feeling sure you will be pleased—"

Wife: "Thank heavens! Won't you have some potatoes, dear?"

—Texaco Topics,
The Texas Company.

* * *

The "Price of Gas"

A tourist, traveling through North Carolina, recently rolled up to a filling station and stopped for gasoline. Out in front of the station was the following sign:

The Price of Gas—

J. C. B. Ehringhaus	6c.
Washington, D. C.	1c.
The Company	6½c.
Transportation	3c.
Me (If I Collect It)	2c.
Total	18½c

Diagonally across the sign, written in chalk, was the following:

"Closed. To hell with such a business"

—The Shield,
Phillips Petroleum Co.

Any item that turns over fast, pays 66⅔% profit and brings customers out of their way to get it, is a "natural"!

When this same item satisfies users to the point of their telling friends about it—and where to get it—it becomes well nigh indispensable to the business of increasing sales.

Pyroil is this kind of an item. It tells customers, "Come in Again"! And they do—not only for Pyroil, but for greases, oil changes, accessories.

Get the habit of adding Pyroil with every filling of gas, every addition of oil. Collect that 66⅔% EXTRA PROFIT each time. And, most of all, keep customers coming to YOUR station. Pyroil, merchandised properly, will do just this. Our nearest distributor will show you how and why. Give him a call. Manufactured and Guaranteed by Pyroil Company, W. V. Kidder, Founder, 464 LaFollette Ave., LaCrosse, Wisconsin, U. S. A.

A FEW CHOICE FRANCHISES AVAILABLE TO DISTRIBUTORS. MAIL COUPON BELOW

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"My Greatest Thrill on the Speedway." Stories of thrills, spills, crashes, as told by world famous auto racing pilots. Illustrated and color. Mail coupon for your Free copy.

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☐ Send facts of Franchise Opportunity.

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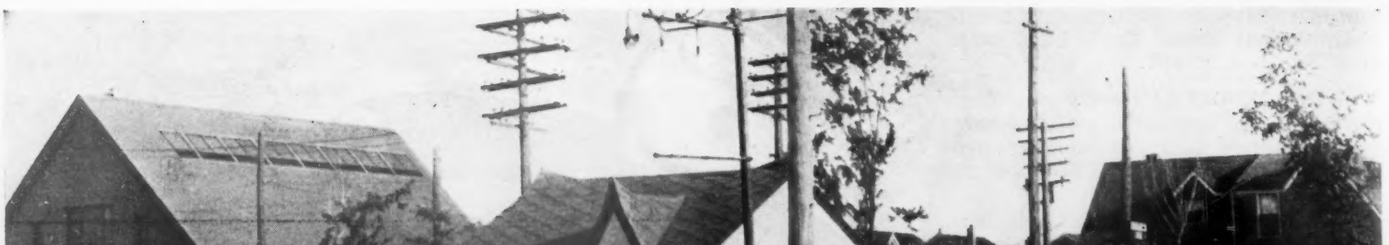
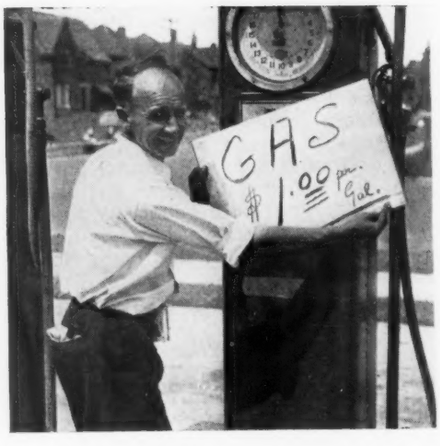


'Gas' Goes to $1 a Gallon in Detroit—But Not For Long



Curious crowds were drawn to the service stations of certain Detroit independent dealers during the past few days in the furore accompanying attempts to enforce Michigan's new fair trade law. The attraction was caravans of members of the Michigan Gasoline Dealers Union Local No. 1, who blockaded the station drives.

Drivers of the string of cars entering the stations would demand one gallon of gasoline at a discount and all the free services, for which they gave the attendant a $10 or $20 bill to change. Many of the stations were forced to close their doors, being unable to cope with the situation.

Gasoline suddenly went up to $1 a gallon August 16 when one dealer attempted to outwit the union dealers who blockaded his station drive. At the suggestion of a policeman the boost in price was made in an effort to solve the situation. One sale was reported made at $1, and one at the normal price. When the caravan left the station the dealer went back to his "regular prices."

Petroleum Derivative on A. C. S. Program

ROCHESTER—The petroleum division of the American Chemical meeting here Sept. 6 and 7 will divide its sessions into three general heads. The first, a symposium on the chemical utilization of petroleum hydrocarbons, will be presided over by Dean Frank C. Whitmore, Pennsylvania State College. Thomas Midgley, Jr., Ethyl Gasoline Corp., will preside over a symposium on characteristic properties of hydrocarbons and their derivatives as related to structure. A general meeting of the petroleum division will follow each of these symposiums on the two succeeding days. Dr. J. C. Morrell, Universal Oil Products Co., will preside at both of these meetings.

The utilization program will be opened with an outline of the numerous refining processes which produce source material for chemical derivatives and of the more important products. Dr. Gustav Egloff and J. C. Morrell have prepared this discussion. C. O. Tongberg, W. J. Sweeney and M. R. Fenske have separated 36 standardized fractions of virgin naphthas whose properties will be discussed.

Olefins and Conjugated Dienes from Gas Oil is next subject for discussion by Hans Tropsch, Charles L. Thomas, Dr. Egloff, and J. C. Morrell.

A new method for determination of individual butenes in refinery gases and a new reaction method of determining isobutene are to be presented by W. A. McMillan, The Texas Co. In a study of catalysts for the equilibrium, ethylene-water-ethanol, 5% silver sulfate in sulfuric acid on pumice was found to be best, it will be brought out in a paper by A. J. Paik, Sherlock Swann, Jr., and D. B. Keyes, all of the University of Illinois.

The Direct Synthesis of Esters from Olefines and Organic Acids has been outlined for presentation by T. W. Evans, K. R. Edlund, and M. D. Taylor, Shell Development Co. Several new catalysts, including mild oxidizing agents such as nitrates, will be described by R. D. Snow and F. E. Frey, Phillips Petroleum Co., in the Reaction of Sulfur Dioxide with Olefins. A discussion of the Rate of Polymerization of Ethylene in the Gas and Liquid Phase by F. R. Russell and H. C. Hottel, Massachusetts Institute of Technology, is concerned with uncatalysed reactions.

Polymerization of Propylene by Dilute Phosphoric Acid will be presented by L. A. Monroe and E. R. Gilliland, also of Massachusetts Institute of Technology. A Study of the Reaction Mechanism for the Nitration of the Paraffin Hydrocarbons, by R. F. McCleary and E. F. Degering, Purdue University, and Nitration of N-Pentane, by H. B. Hass and J. A. Patter-

(*Continued on page* 55)

More Motorists Ask Discounts As 'Gas' War Hits Headlines

By JOHN W. THOMPSON
N. P. N. Staff Writer

DETROIT, Aug. 24.—The Shirley Temple dolls, the teddy bears, the Cuban vases, the dishes and glassware, and all the other premiums once offered by some of the more liberal minded dealers in this vicinity, are today for the most part conspicuously absent.

That much the Michigan fair trade law has definitely accomplished, due to the assistance it has received from County Prosecuting Attorney Duncan C. McCrea and his staff who have been busy for the past two weeks warning the premium-offering violators and showing them a picture album of jail photos.

Meanwhile, the front-page publicity given the anti-discounting "war" has made more motorists aware of the practice; more and more often are dealers confronted now with the question, "How much off?"

Without benefit of publicity or three-sheet posters, assistant prosecutor Paul Mayrand and his crew of investigators have been busy weaving a net around Detroit's retail oil business. Each week the net is drawn a little tighter, and if it continues to hold without breaking, some interesting "specimens" are certain to be brought up out of the "deep."

Last week McCrea and Mayrand tightened the net rope a little, when, in an effort to uncover the extent to which certain dealers were offered wider margins than others they mailed over 40 registered letters to automobile companies, tire manufacturers, and large oil companies, asking for copies of their contracts pertaining to the sale or purchase of petroleum products which they had with dealers in the Detroit area who are known to be offering discounts.

Among the high-ranking officials to whom these letters were sent by registered mail, were Edsel Ford and Harvey Firestone.

The letters ask the individuals personally if they "have any knowledge of any arrangement whatsoever, verbal or otherwise," to which their company or any other person or company is a party to such written contracts.

In addition, the letters politely call attention to the clause in the Michigan fair trade law which states that any person or agent of any company who knowingly assists anyone who is violating this law is equally responsible for the violation. McCrea asks for a reply "in the very immediate future."

Grand Jury Probe?

According to the prosecuting attorney's office, the results, or lack of results, of this letter will largely determine whether a grand jury investigation is necessary.

The Retail Gasoline Dealers Assn. of Michigan, Inc., through its secretary, Rankin P. Peck, is working closely with the prosecuting attorney, feeding in data and information of use to the county in establishing its cases against violators of the new fair trade law. Peck, many times trying the patience of his members by his cautious, though deliberate, efforts to bring about enforcement of the law, knows what many dealers do not know or realize, that a law is not a law until enforced, and that enforcement comes only after the proper authorities act. That is Peck's objective now; to give the enforcement agencies enough facts to bring action.

Impatience over the continued discounting which prevails in Detroit in the face of the new law has turned some independent dealers to plans of direct action individually. Already, during the past ten days, eight Detroit dealers are known to have filed damage suits totaling $70,000 against four large gasoline retailers who jointly advertised a resumption of their discounting policy, charging that such an act indicates a combination in a violation of the state anti-trust laws. Additional suits are being filed almost daily.

Defendants in these suits are James J. Bright & Son, Firestone Auto Supply & Service Stores, Ned's Auto Supply Co., and Stark Hickey, Inc.

Union Takes Hand

Another threatening club was swung over discounting dealers at a meeting here Aug. 18 of the Michigan Gasoline Dealers Union Local No. 1, when Herman Kierdorf, business agent for Local 389 of the International Assn. of Oil Field, Gas Well & Refinery Workers of America, a C.I.O. affiliate, said that if other means failed the union petroleum truck drivers would be called upon to stop delivery of gasoline to stations offering discounts.

At this meeting, the dealers' union, also a C.I.O. affiliate, announced a continuation of its "worry war" on discounting stations. The plan of action in these wars involves blockading the drives of discount stations with cars of union dealers. Driving into a discount station, the dealers attempt to buy one gallon of gasoline, demand a discount and all the free services and then give the attendant a $10 or $20 bill to change.

Although Frank Lake, president of the dealers' union, said their drive is bringing many dealers into line, the effort has not been without complications. Early last week gasoline went to $1 per gallon "to union dealers only", as one dealer attempted to turn the tables on the one-gallon buyers.

'Gas' $20 a Gallon

Taking a hint from this idea, another dealer who was paid a visit by the union caravan on Aug. 20 and who was handed $20 bills to change, quickly made up a sign which read "Gasoline, $20 A Gallon". This price, the dealer said, would continue in effect for the "worry warrior", while other customers would get the regular discount on their gasoline, provided 'they could get into the station."

The front-page publicity which the dealers' union has rated through its picketing methods has not had the desired effect in lining up the public against discount stations. Instead, the publicity has worked in favor of the discounting dealers, who almost without exception report that the visits of the union caravans has had an excellent advertising effect on their business.

One neighborhood dealer who had been visited by the caravan and his drives blockaded, reported that following the episode his customers drove in, joked about the situation, and pledged him their continued support. One indignant motorist asked the dealer, "What are they trying to do, run you out of business?"

The newspaper fanfare covering the local retail turmoil has done the war on discounting no good. In fact, motorists who never before knew that it was possible to obtain gasoline discounts at service stations are now bearing down on dealers and demanding their two cents off. One dealer said that while he had no requests for discounts a few weeks ago now hardly a day goes by that he does not receive at least eight or nine such requests.

Thus in an effort to stamp out discounting, rebating, and other unfair trade practices, there are at present the prosecuting attorney, who is attempting to establish evidence of marginal discrimination, the Retail Gasoline Dealers Assn. of Michigan which is policing the city and reporting alleged violations, and the dealers' union which is waging a "worry war" against discounting dealers.

Aware of Discounts Now

In the face of these efforts Detroit newspapers are, unconsciously perhaps, publicizing the discount war to the point where Detroit motorists are today probably more conscious of the availability of discounts than they have been for many years.

But the Detroit tempo is one of speed. There is a germ in the air which inspires an impulsive urge to do something about something, and to do it first. Perhaps that partly explains the present plight of the local retail situation. Perhaps it also accounts for the fact that the evening newspapers are on the streets in time for breakfast, and that the morning papers are out in time for supper the night before . . . . and where even the clock in the prosecutor's office is ten minutes fast.

Accessories Time-Payment Plan

N. P. N. News Bureau

CHICAGO, Aug. 23.—The Pure Oil Company has announced a four month time payment plan on the purchase of accessories by dealers.

Under the title "Fall Dating Plan" Pure offers a complete line of accessories to dealers with the first payment due about 30 days after receipt of the merchandise. Subsequent payments are due at 30-day intervals. This will allow the dealer to make accessory sales without the necessity of having his ready capital tied up in stock.

In announcing the plan the Pure "Globe" cites a hypothetical case of a dealer who receives his stock of winter merchandise on or about September 15. One-fourth of the total amount of the purchase will become due about October 12, thus leaving almost a month in which to start moving the merchandise previously received.

The next payment is not due until November 12, the third payment December 12, and the final payment January 12.

This will allow four months turn the stock sold to the dealer in this manner at no increased cost price.

On purchases under the plan as outlined above, a schedule of discounts is allowed.

If payment of the entire amount is made October 12, the dealer is entitled to a 5 per cent discount.

If the first payment is made on time and the balance of the total amount of the purchase is paid by November 12, a 4 per cent discount is allowed.

Similarly, if the first two payments are made on time and the balance paid by December 12, a 3 per cent discount will be allowed.

Where a dealer uses the four-payment plan, and where all payments have been made on time, he is entitled to a cash discount of 2 per cent for the entire amount of the original invoice.

This time payment plan was put into effect to enable dealers to carry an adequate stock of seasonal accessories without tying up capital. It also enables those dealers who otherwise may not be able to do so to stock up at the proper time.

Accessories purchased under the plan are ordered through a special blank, lessening the probability of overlooking items. Dealers also may anticipate arrival of merchandise and be prepared to give it a more advantageous display.

Only ONE Paint Rated 100%

...a Bakelite Resin Finish

Interior of million-gal. water tank on which 196 painting systems were tested by prolonged immersion

LASTING protective value in paints for structural steel depends not only on imperviousness to moisture, but also on resistance to deterioration from moisture and other causes. In paints for metal tanks, these characteristics are even more important.

That is why Pittsburgh-Des Moines Steel Company tested 196 different painting systems to discover adequate protection for steel tank interiors. Each system was applied in a vertical panel; the tank was filled with water, and emptied only for monthly inspection.

After 571 days, one panel showed marked superiority. Technical Bulletin No. 3304, issued by the steel company, presents this conclusion: "Certain paints of the synthetic gum vehicle type are best suited for such exposure, and one particular paint with a Bakelite resin base vehicle was rated 100% of its original condition at the conclusion of the test".

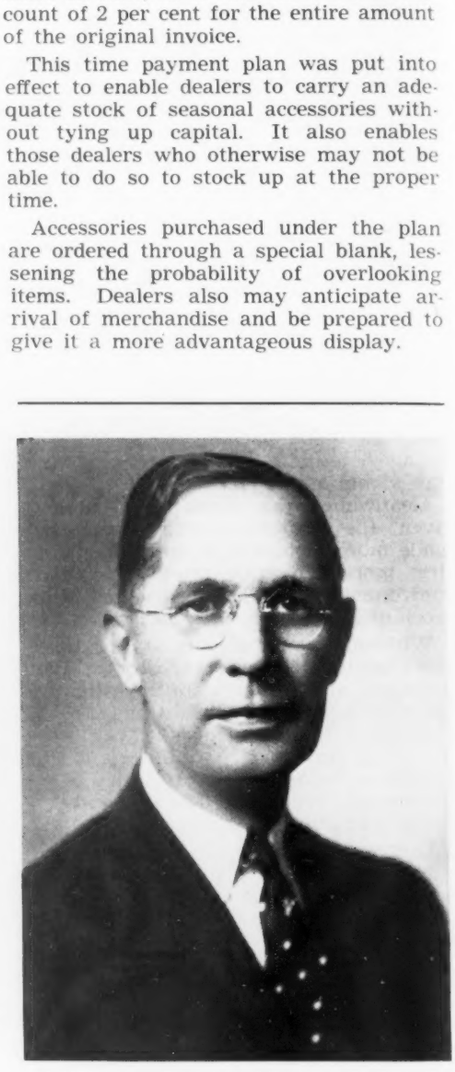
Metal paints and many other coatings are now fortified with Bakelite resins by leading paint manufacturers. Write for our booklet 29S, "Bakelite Synthetic Resins", which explains why.

BAKELITE CORPORATION, 247 PARK AVENUE, NEW YORK, N. Y.
BAKELITE CORPORATION OF CANADA, LTD., 163 Dufferin Street, Toronto, Ontario
West Coast: Electrical Specialty Co., Inc., 316 Eleventh Street, San Francisco, Cal.

BAKELITE

The registered trade marks shown above distinguish materials manufactured by Bakelite Corporation. Under the capital "B" in the numerical sign for infinity, or unlimited quantity, it symbolizes the infinite number of present and future uses of Bakelite Corporation's products.

SYNTHETIC RESINS



Benjamin F. Geyer

FT. WAYNE, IND., Aug. 20.—A background of 30 years with the gasoline pump industry, 25 of which have been with The Wayne Pump Co., fits Benjamin F. Geyer to the presidency of the latter company. He was elected to that post, July. 1. He also continues as general manager.

Mr. Geyer joined the old Wayne Co. as advertising manager in 1912. In 1919 he was made general manager and a director. In 1929, one year after the Wayne Pump Co. was organized as a holding company and the Wayne Co. continued as the operating company, Mr. Geyer was made president of the latter. Last year, when the Wayne Co. was dissolved, and the Wayne Pump Co. became the operating company, he was vice-president and general manager.

Mr. Geyer was born May 7, 1882 at Plymouth Ind. One of his early positions was sales correspondent with S. F. Bowser & Co., also a pump manufacturer of Ft. Wayne.

The Wayne company is one of the large manufacturers of gasoline pumps.

A. C. S. Program

(*Continued from page* 52)

son, also of Purdue, will conclude the utilization program. The latter paper will show how the vapor-phase technique has been extended to normal pentane.

The last two papers are to be given at the opening of the afternoon session. Dr. Morrell will take the chair then for the general session to be opened with a discussion of The Proximate Analysis of Gasoline prepared by C. L. Thomas, H. S. Block and James Hoekstra, Universal Oil Products Co.

Other subjects which follow are Column Performance in the Rectification of Petroleum, by R. C. Gunness, Massachusetts Institute of Technology; the Separation of the Three Methyloctanes from Mid-Continent Petroleum, by J. D. White and A. R. Glasgow, Jr., Bureau of Standards; and Recovery of Mercaptans from Cracked Naphtha Fractions, by R. W. Crary and M. M. Holm, Standard Oil Co. of Cal.

The latter is concerned with correlation of equilibrium data and application to the design of commercial equipment. The first half of the session will close with a paper on Recent Advances in the Chemistry of Petroleum Bases, by R. I. Mahan and J. R. Bailey, Union Oil Co. and University of Texas.

Tuesday morning's symposium on characteristic properties of hydrocarbons and their derivatives as related to structure will open with a discussion of Freezing Points of a Number of Pure Hydrocarbons of the Gasoline Boiling Range and of Some of Their Binary Mixtures, by J. Smittenberg, H. Hoog and R. A. Henkes, N. V. De Bataafsche Petroleum Maatschappij. W. R. van Wijk of the same company will talk on viscosity and draw attention to the fact that it is possible to consider the viscosity of a liquid as mainly a function of the space available for the molecules.

A. V. Grosse, Universal Oil Products Co., will describe the determination of refractive indexes at low temperatures and show how they may be used for the quantitative determination of closely boiling compounds. Boiling Points and Critical Properties of Hydrocarbon Mixtures is to be presented by R. L. Smith and K. M. Watson, Universal Oil Products Co., who point out that no one type of average boiling point is suitable for all properties. Different average boiling points have been developed.

F. D. Rossini, U. S. Bureau of Standards, concludes in a paper which he will present on The Heats of Formation of the Simple Organic Molecules, that new measurements are needed in many instances. Isolation of Pure Isomeric Hexanes from Natural Gas, including the Determinations of Their Physical Properties and the Phase-Equilibrium Diagram of the Condensed System n-Heptane —2-Methylpentane is the lengthy subject to be presented by J. H. Bruun, Mildred M. Hicks-Bruun, and W. B. Mason Faulconer, Sun Oil Co.

Continuing in the afternoon, A Study of the Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System will be presented by W. B. Key, Standard Oil Co. (Ind.) It is indicated that the solution laws break down completely in the critical region. The Compressibility of Liquid Naphthalene, by F. R. Russell and H. C. Hottel, Massachusetts Institute of Technology; The Chemical and Physical Properties of Dicyclic Naphthenes, by W. F. Seyer and R. D. Walker, University of British Columbia; and The Mutual Solubilities of Hydrocarbons, by Mr. Seyer, will conclude the symposium.

Again presiding for the general session Dr. Morrell will call upon R. F. Marschner, Standard Oil Co. (Ind.) to present the Thermal Decomposition of n-Octane. Last on the technical program will be a paper on The Alkylation of Paraffins with Olefins and the Identification of the Paraffins Formed, by A. V. Grosse and V. N. Ipatieff, Universal Oil Products.

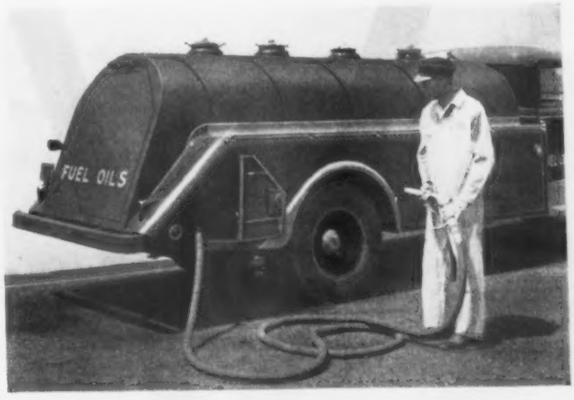
Fred A. Gustafson Dies

N. P. N. News Bureau

CHICAGO, Aug. 23.—Fred A. Gustafson, vice president and treasurer of the Gustafson Bros. Oil Co. here died August 17 at the Swedish Memorial Hospital after an illness of several months. Mr. Gustafson who was 50 years old had been in ill health for the past two years.

He was well known in the oil industry for the past 30 years. He started with the old Star Oil Co. here in 1905. In 1922 he joined his brother, Charles A. Gustafson, in organizing the Gustafson Bros. Oil Co.

Funeral services were held Aug. 20 at Humboldt Park Mission Church. Burial was at Rosehill Cemetery.



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GOODALL

"NEWTYPE CORD"

(U. S. PATENT NO. 1948410)

SYNPLASTIC FUEL OIL HOSE

The SYNPLASTIC TUBE in GOODALL "Newtype Cord" Fuel Oil Hose greatly increases the life of the hose by resisting the action of oil and preventing swelling. This non-swelling feature also insures a maximum flow indefinitely, and permits recoupling whenever necessary.

The patented construction of interwoven wire and cord, with cover and tube forced into the weave, prevents the hose from flattening and permits a full flow, even when the hose is partially reeled.

Records show that this dependable, long-wearing hose insures a *new low* for fuel oil delivery costs by providing quicker deliveries, more stops per day and more gallons delivered per truck. Drivers like it because it is easy to handle—light, flexible, kink-free.

Put GOODALL "Newtype Cord" on one or two of your trucks, then compare delivery costs with the balance of your fleet!

Available in sizes from 1" to 2" I.D., and lengths up to 150 feet.

CURB PUMP HOSE

GASOLINE TRUCK UNLOADING HOSE

GOODALL RUBBER COMPANY

NEW YORK-PHILADELPHIA-PITTSBURGH-CHICAGO-CLEVELAND-HOUSTON

GOODALL MECHANICAL CORP.

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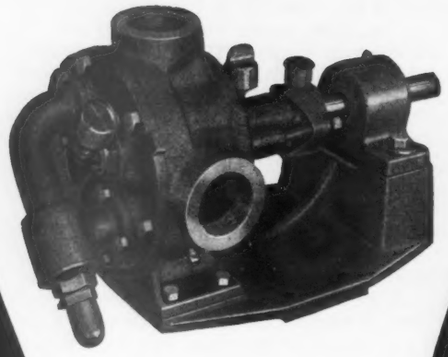

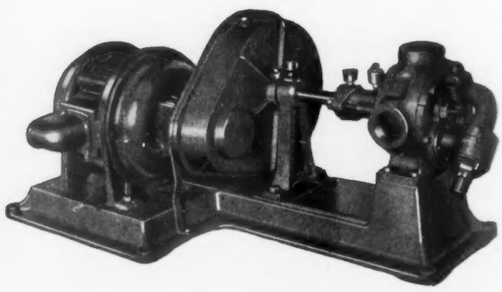

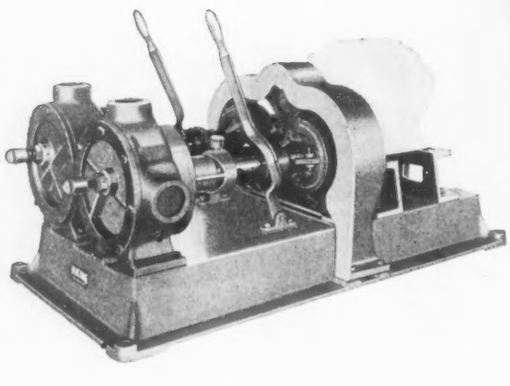

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Made to Serve the Industry

Yes, and that's exactly what Viking Pumps are doing today—serving the Oil Industry from top to bottom. Wherever you go, if they're handling petroleum products, you're sure to find Viking.

Designed and built specifically for the petroleum industry . . backed by 26 years of experience and research . . proved for efficiency and dependability under every capacity and condition . . is it any wonder that there are more Viking Pumps serving this industry today than any other make. Modernize your plant with Viking. Write for bulletins and prices.

VIKING PUMP CO.

CEDAR FALLS, IOWA

Markets

At a Glance . . .

Mid-Continent: Refined gasoline spotty; natural active.

Gulf Coast: Exporters buy two cargoes of gas oil.

California: Export interest continues active.

Mid-Western: Gasoline lags; prices steady.

Eastern Seaboard: Gasoline demand active.

Pennsylvania: Lower field kerosine higher.

Wax: Scale trading quiet.

Wax

Scale Dull

NEW YORK, Aug. 23.—A dull market prevailed for crude scale wax during the week ended Aug. 21. Several traders said that there were indications of a revival of export buying, but that so far there had not been much actual business. Domestic demand was reported steady.

The market appeared not much changed from the previous three weeks. Generally speaking, refiners' stocks were said to be in good shape and they were holding for business at unchanged prices. Apparently there was more 124-126 white crude scale available at 2.95 cents than had been the case, but offerings at under this price were reported few.

Eastern

Gasoline Demand Good

N. P. N. News Bureau

NEW YORK, Aug. 23.—Gasoline consumption throughout the eastern states continued at a high rate during the week ended Aug. 21, according to reports from distributors. Terminal suppliers generally reported excellent movement to jobbers and to their own distributors. The bulk of the movement to jobbers continued against contracts, they said.

No general changes were reported in wholesale gasoline markets during the week. No barge sales of above 65 octane gasoline were reported at New York harbor below 7.5 cents and terminal operators continued to ask 7.75 to 8 cents for tank car shipments of this grade. Some sales for truck pickup in New Jersey for local distribution were reported at 7.5 cents. Wholesale markets at southern seaboard terminals were reported steady.

Retail gasoline markets continued unsettled in some of the larger metropolitan centers, including New York City, Philadelphia and Boston. Some stations in New York were selling at 10 cents a gallon, exclusive of taxes and many at Philadelphia were selling regular grade gasoline at 11 cents, ex-taxes.

Occasional barge sales of kerosine were reported during the week, but generally speaking this market was quiet. No changes were reported in prices, with tank car sales mostly at 6.25 to 6.4 cents along the seaboard.

California

Export Interest Lively

N. P. N. News Bureau

LOS ANGELES, Aug. 21.—Echoes of the Sino-Japanese war continued to stimulate interest in export shipments of aviation gasoline from Pacific Coast ports to the Orient. Reports of inquiries for substantial quantities of this product were current but no confirmation could be obtained of actual spot shipments, although considerable movements of gasoline were said to be moving under contract and between major suppliers and subsidiaries.

N. P. N. Gasoline Index

	Dealer T.w. Cents per	Tank Car gal.
Aug. 25	10.67	6.74
Month ago	10.67	6.77
Year ago	10.28	6.42

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 13 wholesale markets for regular-grade gasoline.

Natural gasoline prices were easier, with small quantities available at 7.25 cents a gallon, although most suppliers continued to ask 7.5 cents.

Reflecting continued good demand, burning oil prices were firm. At independent plants in the Los Angeles Basin area, diesel oil was generally quoted at 3.75 cents a gallon, although small quantities were still available at 3.5 cents.

Kerosine-distillate was offered at 3.75 cents at independent plants in the Basin, but because of relative scarcity of this product in the San Joaquin Valley prices for a similar product there were generally held at 4.75 cents.

No important changes were made in wholesale or retail gasoline prices in Pacific Coast territory during the week.

Mid-Western

Gasoline Quiet

N. P. N. News Bureau

CHICAGO, Aug. 23.—The Mid-Western gasoline market again experienced a featureless trading period the third week of August. Open market buying was reported slow by all sellers. Offerings of all grades of gasoline, with the possible exception of low octane, were liberal.

Offerings of low octane U. S. Motor at 4.75 cents were less numerous as the week progressed, and while the supply available at this price Aug. 20 and 21 was limited, it still was sufficient to make this price a market factor.

While some sellers were inclined to lay blame for slow open market demand to the buying of gasoline from jobbers with marginal contracts, a check here failed to substantiate this belief. While reports of this practice still persist, it appeared to be less prevalent.

Other resellers laid the loss of business to refiners, who, they said, were taking orders direct from jobbers at prices which resellers could not meet. A check with buyers in the middle west failed to corroborate this, however.

Kerosine received little attention from Chicago traders. Prices, however, were steady. Reports here were that refiners were holding kerosine for blending with fuel oil to supply the expected heavy demand for the latter product next winter.

Coastal

Gas Oil Interest Increases

N. P. N. News Bureau

NEW YORK, Aug. 23.—More interest was shown in gas oil and light fuel oil at the Gulf the past week and two sales were reported.

One sale, involving a full cargo of a No. 2 grade oil for export lifting around Aug. 27 was reported at 4.25 cents, f.o.b. Gulf. The other, also at 4.25 cents the Gulf, was for approximately 30,000 barrels of 30 plus gravity gas oil for prompt export lifting.

Traders' opinion of the gas oil and No. 2 fuel oil markets varied from 4.125 to 4.25 cents a gallon, depending mostly on the delivery period. For October lifting the general opinion was that 4.25 cents was the market for these grades. Some

(Continued on next page)

Fuel Oil . . . . .

N. P. N. News Bureau

CHICAGO, Aug. 23.—Heating oils were the most active products in the Mid-Western market the third week of August. With August slipping away, and the burning oil season in the offing, prices for Nos. 1, 2 and 3 oils were steady to higher.

Resellers here reported they were unable to obtain a sufficient supply of these oils for over the balance of the year. Jobber-buyers, attempting to shade current market quotations, were running into a stone wall.

Some light fuel from Michigan moved into normal Group 3 selling territory at slightly shaded prices, but its field of activity was limited, and these sales had no effect on prices from the southwest.

Heavy fuels were steady, although interest in these grades was limited.

* * *

NEW YORK, Aug. 23.—Light fuel oil markets were quiet along the eastern seaboard the past week. This quietness, however, did not indicate easiness in the price structure, traders reported, but was merely the usual calm that prevails during August. No changes were reported in prices of Nos. 2 or 4 fuel oils, during the week.

Some barge movement of No. 2 fuel was reported at New York harbor at 5.125 cents, f.o.b. terminal, and this was the price quoted by practically all companies willing to sell in the spot market. Several brokers said they had been unable to find any No. 2 fuel that could be moved at under this price.

Heavy fuel oil was more freely offered to the trade at $1.35 per barrel at New York harbor. Reports were that part cargo or cargo lots were available at around $1.30, f.o.b. the harbor.

* * *

TULSA, Aug. 23.—Reports were heard in the Mid-Continent late last week that buyers were bidding above present market levels for certain grades of light fuels oils for deferred shipment. Other buyers continued to search for supplies with only fair success. Refiners reported they either were well booked or were storing for the future.

Demand for U. G. I. gas oil for cracking stock continued active although several refiners reported lower crude charges last week.

Industrial fuels were active with some new inquiries reported in the market. Stocks remained comparatively low in all districts.

Coastal Market

(*Continued from page* 57)

traders said that for September lifting 4.125 cents could be done, although few cargoes were reported available for open, spot movement at either price.

One trader, who was offering a cargo for September lifting, said he had been unable to move it at 4.25 cents but was unwilling to sell at 4.125 cents. One buyer reported being offered a cargo of 30 plus translucent oil firm at 4.125 cents for September but said he was unable to use it for that period.

Sale of a part cargo of 44 w. w. kerosine—15,000 to 20,000 barrels—was reported at 5.375 cents a gallon f.o.b. Gulf for export lifting late in September or early in October. Traders said this grade of kerosine was hard to obtain.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect Aug. 23, 1937

Following are tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 3	No. 4
S. O. NEW JERSEY				
Newark, N. J.	*	7.00	7.00	7.00
Atlantic City, N. J.	*	6.75	6.75	6.75
Baltimore, Md.	7.50	7.00	7.00	7.00
Washington, D. C.	7.75	7.25	7.25	7.25
SOCONY-VACUUM OIL CO. INC. (S. O. New York Division)				
New York City	*	7.50	7.50	7.50
Albany, N. Y.	*	7.50	7.50	7.50
Rochester, N. Y.	*	7.50	7.50	7.50
Boston, Mass.	*	7.00	7.00	7.00
Bangor, Me.	*	8.00	8.00	8.00
Manchester, N. H.	*	8.00	8.00	8.00
Burlington, Vt.	*	8.00	8.00	8.00
New Haven, Conn.	*	7.50	7.50	7.50
Providence, R. I.	*	6.75	6.75	6.75

*Prices for No. 1 fuel in S. O. New Jersey and Socony-Vacuum territories same as for kerosine, which see in tank wagon table for various cities; prices change with kerosine.

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING				
Philadelphia, Pa.	7.25	6.50	6.50	6.50
Allentown, Pa.	7.25	6.50	6.50	6.50
Wilmington, Del.	7.75	7.00	7.00	7.00
Springfield, Mass.	9.00	7.50	....	7.50
Worcester, Mass.	9.00	7.50	....	7.50
Hartford, Conn.	9.00	7.50	....	7.50

S. O. OHIO				
*Ohio Statewide	8.00	8.00	7.50	6.75

Note: S. O. Ohio prices are for hose dumps, bucket dumps are 0.5c per gallon higher.

*Except Cleveland Division and City of Toledo. In Cleveland Division (Cuyahoga, Lake and Geauga counties), No. 1 price is same as statewide; Nos. 2, 3 and 4 are 0.5c higher; No. 5 is priced 0.25c lower than No. 4. In Toledo No. 2 is 0.5c lower than statewide, others same.

S. O. INDIANA

Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	7.00	7.00
Indianapolis	....	*11.7
Detroit	....	7.1
Milwaukee	8	7.3
Minneapolis	7.5	7.5
Sioux City	7.1	7.1
St. Louis	7.5	6.8
Kansas City	6.5	6.5

*Includes state tax of 4c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

Mid-Continent

Natural Gasoline Active

N. P. N. News Bureau

TULSA, Aug. 23.—Demand for gasoline was spotty last week, most Mid-Continent refiners said, but prices remained steady in all districts.

Some refiners reported a noticeable drop in their shipments of gasoline the first part of the week but experienced some improvement the last few days. Others said they did not feel any let-up in demand until late in the week. A few refiners said their orders remained fairly constant throughout the week.

There apparently was some attempt made in a few quarters to begin liquidation of stocks but not in sufficient measure to have any noticeable effect on prices.

New buying of Grade 26-70, both by domestic refiners and by exporters, kept the natural gasoline market firm throughout the week. The lower vapor pressure grades were not in as brisk demand and some material was sold at below the usual percentage differential above the 26-lb. material. One purchaser, for example, obtained approximately 100 cars of 18-lb. natural gasoline at approximately 0.15 cent per gallon under the normal 20 per cent price differential.

Kerosine was scarce for spot shipment. Inquiries were more numerous in all districts. Several refiners reported their contract customers were now ordering out larger quantities of the oil.

Export demand for lubricating oils continued to keep the western market fairly active with prices apparently more firmly entrenched at present levels.

Pennsylvania

Kerosine Higher

N. P. N. News Bureau

CLEVELAND, Aug. 23. — Kerosine prices were higher in the lower Pennsylvania field the past week. Other products were steady in both upper and lower fields.

Lower field kerosine prices began and ended the week with an advance, each time 0.125 cent a gallon. The first advance brought the 45 w. w. grade to a minimum of 4.875 cents and the second brought the general level to 5 cents, f.o.b. refinery. A number of refiners had advanced their selling prices to 5 cents late in the previous week but offerings were reported below that level until Aug. 20, when only scattered cars were available at 4.875 cents.

Demand for kerosine continued good even at the higher prices, refiners reported. Prices in the upper field were unchanged.

The general feeling in the lubricating oil market was one of satisfaction, with traders reporting an improvement in demand for neutral oils, bright stocks and high flash cylinder stocks. Demand has not been heavy, most refiners said, but movement has been good enough to keep distress oil from appearing.

Gasoline and fuel oil were reported in good demand and steady at unchanged prices. Several refiners said they were entirely sold up on fuel oils.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon, except heavy fuel oils in dollars per barrel, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Gasoline *and* Naphtha

Prices Effective	Aug. 23	Aug. 16
OKLAHOMA		
U. S. Motor:		
62 oct. & below	5.00 – 5.25	5.00 – 5.25
63-67 oct.	5.375– 5.75	5.375– 5.75
68-70 oct. (regular)	6.00 – 6.125	6.00 – 6.125
60-62, 400 e.p.	5.00 – 5.25	5.00 – 5.25
64-66, 375 e.p.	*5.00 – 5.25	*5.125– 5.375
68-70, 350-360 e.p.	*5.125– 5.375	*5.25 – 5.375
WESTERN PENNA.		
Bradford-Warren:		
52-54 naphtha	*6.00 – 6.125	*6.00 – 6.125
Motor gasoline:		
U. S. Motor (58-62°)	6.00 – 6.25	6.00 – 6.25
Min. 60 oct.	*7.50 – 7.75	*7.50 – 7.75
Min. 65 oct.	*7.75 – 8.00	*7.75 – 8.00
64-66, 390 e.p.	6.125– 6.25	6.125– 6.25
68-70, 350-360 e.p.	6.25 – 6.375	6.25 – 6.375
Other districts:		
52-54 naphtha	*5.875– 6.00	*5.875– 6.00
54-56 naphtha	*6.00 – 6.125	*6.00 – 6.125
Motor gasoline:		
U. S. Motor (58-62°)	6.00 – 6.125	6.00 – 6.125
Min. 60 oct.	7.375– 7.75	7.375– 7.75
Min. 65 oct.	7.50 – 8.00	7.50 – 8.00
64-66, 390 e.p.	6.00 – 6.125	6.00 – 6.125
68-70, 350-360 e.p.	6.25 – 6.375	6.25 – 6.375
CALIFORNIA (3c tax to be added to prices if used in state)		
U. S. Motor:		
54-58, for instate shipment	7.75 – 9.25	7.75 – 9.25
54-58, for outside state shipment	8.25 – 9.00	8.25 – 9.00
58-61, 375-400 e.p., 65 oct. & above	8.50 – 9.75	8.50 – 9.75
†N. TEX. (For shipment to Texas and N. Mex. destinations; Group 3 prices quoted on northern shipments).		
U. S. Motor:		
62 oct. & below	5.125– 5.25	5.125– 5.25
63-67 oct.	5.50 – 5.625	5.50 – 5.625
68-70 oct. (regular)	6.00 – 6.25	6.00 – 6.25
60-62, 400 e.p.	*5.125– 5.375	*5.125– 5.375
KANSAS (For Kansas destinations only)		
U. S. Motor:		
62 oct. & below	5.375– 5.625	5.375– 5.625
68-70 oct. (regular)	6.375– 6.625	6.375– 6.625
†W. TEX. & N. MEX.		
U. S. Motor:		
62 oct. & below	5.125	5.125
63-67 oct.	5.50	5.50
68-70 oct. (regular)	6.125	6.125
†E. TEX.		
60-62, 400 e.p.	*5.125– 5.25	*5.125– 5.25
N. LA. (For shipment within La. & into Ark.)		
U. S. Motor:		
62 oct. & below	5.50	5.50
63-67 oct.	5.75 – 6.00	5.75 – 6.00
68-70 oct. (regular)	6.50	6.50
ARKANSAS (For shipment within Ark. & into La.)		
U. S. Motor:		
62 octane & below	5.50	5.50
63-67 oct.	6.00	6.00
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	8.75	8.75
Above 65 oct.	9.00	9.00

Natural Gasoline

(Prices are those to blenders on freight basis shown below. Shipments, however, may originate in other Mid-Continent manufacturing districts, such as Panhandle Texas, S. W. Texas or Kans.)

F.O.B. GROUP 3		
Grade 26-70	4.00	4.00
F.O.B. BRECKENRIDGE		
Grade 26-70	4.125	4.125
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	7.50 – 7.75	7.50

*Nominal.

‡Only one refiner quoting.

†Refiners report they generally receive from 0.25c to 0.5c per gal. more for gasoline & kerosine for local or differential territory shipment.

Kerosine

Prices Effective	Aug. 23	Aug. 16
WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.00 – 5.25	5.00 – 5.25
46 w.w.	5.125– 5.375	5.125– 5.375
47 w.w.	5.25 – 5.50	5.25 – 5.50
Other districts:		
45 w.w.	5.00	4.875– 5.00
46 w.w.	5.125	5.00 – 5.125
47 w.w.	5.25	5.125– 5.25
OKLAHOMA		
41-43	4.00 – 4.25	4.00 – 4.25
42-44 w.w.	4.25 – 4.375	4.25 – 4.375
KANSAS (For Kansas destinations only).		
41-43 w.w.	4.375– 4.50	4.375– 4.50
42-44 w.w.	4.50 – 4.75	4.50 – 4.75
†N. TEX. (For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments).		
41-43 w.w.	4.25 – 4.375	4.25 – 4.375
†E. TEX.		
41-43 w.w.	*4.00 – 4.125	*4.00 – 4.125
N. LA. (For shipment within La. and into Ark.).		
41-43 w.w.	4.625	4.625
ARK. (For shipment within Ark. and into La.).		
41-43 w.w.	‡4.75	‡4.75
CALIFORNIA		
40-43 w.w.	5.00 – 6.50	5.00 – 6.50

Gas *and* Fuel Oils

WESTERN PENNA.		
Bradford-Warren:		
36-40	4.75 – 4.875	4.75 – 4.875
Other districts: (Excluding Pittsburgh District Prices).		
36-40	4.375– 4.50	4.375– 4.50
OKLAHOMA		
No. 1 white	3.875– 4.00	3.875– 4.00
No. 1 straw	3.625– 3.875	3.625– 3.875
No. 2 straw	3.50 – 3.625	3.50 – 3.625
No. 2 dark	3.375– 3.50	3.375– 3.50
U. G. I. gas oil	3.00 – 3.25	3.00 – 3.25
28-30 zero	3.125– 3.375	3.125– 3.375
28-30	‡$1.25	‡$1.25
24-26	‡$0.90 –$0.925	‡$0.90 –$0.925
18-22	*$0.825–$0.90	*$0.825–$0.90
14-16	*$0.80 –$0.85	*$0.80 –$0.85
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.25	4.25
10-14 fuel oil	$0.775–$0.85	$0.775–$0.85
N. TEX. (For shipment to Texas and N. Mex.; Group 3 prices quoted on northern shipments).		
No. 1 white	*4.00	*4.00
U. G. I. gas oil	2.875	2.875
24-26	$0.85 –$0.875	$0.85 –$0.875
18-22	$0.80 –$0.825	$0.80 –$0.825
N. LA. (For shipment within La. and into Ark.).		
No. 2	3.50 – 3.625	3.50 – 3.625
20-24	$1.10 –$1.15	$1.10 –$1.15
16-20	$0.95 –$1.00	$0.95 –$1.00
10-14	$0.80 –$0.85	$0.80 –$0.85
ARK. (For shipment within Ark. and into La.).		
No. 2	‡3.625	‡3.625
28-30 gas oil, zero	‡3.375	‡3.375
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.65 –$1.00	$0.65 –$1.00
Light fuel	$0.85 –$1.10	$0.85 –$1.10
Diesel fuel (per gal.)	4.75 – 5.00	4.75 – 5.00
Stove dist. (per gal.)	6.25 – 7.00	6.25 – 7.00
Los Angeles:		
Heavy fuel	$0.60 –$1.10	$0.55 –$1.10
Light fuel	$0.90 –$1.20	$0.90 –$1.20
Diesel fuel (per gal.)	3.75 – 5.00	3.75 – 5.00
Stove dist. (per gal.)	4.00 – 7.00	4.25 – 7.00
San Francisco:		
Heavy fuel	$1.15	$1.15
Light fuel	$1.25	$1.25
Diesel fuel (per gal.)	5.50	5.50
Stove dist. (per gal.)	7.50	7.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

Prices Effective	Aug. 23	Aug. 16
WESTERN PENNA.		
Viscous Neutrals (Viscosity at 70° F.)		
200 Vis. (180 at 100°) No. 3 col., 420-425 fl.:		
0 p.t.	27.00 –27.50	27.00 –27.50
10 p.t.	26.00 –26.50	26.00 –26.50
15 p.t.	25.50 –26.00	25.50 –26.00
25 p.t.	24.50 –25.00	24.50 –25.00
180 Vis. (165 at 100) No. 3 col., 410-415 fl.:		
25 p.t.	23.00 –23.50	23.00 –23.50
150 Vis. (143 at 100) No. 3 col., 400-405 fl.:		
0 p.t.	22.50 –23.00	22.50 –23.00
10 p.t.	21.50 –22.00	21.50 –22.00
15 p.t.	21.00 –21.50	21.00 –21.50
25 p.t.	20.00 –20.50	20.00 –20.50
SOUTH TEXAS		
Vis. Color		
Pale Oils: (*Vis. at 100° F.; p.t. 0*)		
100 No. 1½-2½	5.25 – 5.50	5.25 – 5.50
200 No. 2-3	7.25 – 7.50	7.25 – 7.50
300 No. 2-3	7.75 – 8.00	7.75 – 8.00
500 No. 2½-3½	8.75 – 9.00	8.75 – 9.00
750 No. 3-4	9.25 – 9.50	9.25 – 9.50
1200 No. 3-4	9.75 –10.00	9.75 –10.00
2000 No. 4	10.00 –10.25	10.00 –10.25
Red Oils:		
200 No. 5-6	7.25 – 7.50	7.25 – 7.50
300 No. 5-6	7.75 – 8.00	7.75 – 8.00
500 No. 5-6	8.75 – 9.00	8.75 – 9.00
750 No. 5-6	9.25 – 9.50	9.25 – 9.50
1200 No. 5-6	9.75 –10.00	9.75 –10.00
2000 No. 5-6	10.00 –10.25	10.00 –10.25

Note: South Texas red oil prices shown above cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

(0 to 10 P.P.)

Pale Oils: Vis. Color		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	10.00	10.00
200—No. 3	10.50	10.50
250—No. 3	11.50	11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	9.00	9.00
200—No. 5	9.50	9.50
250—No. 5	10.50	10.50
280—No. 5	11.50	11.50
300—No. 5	11.75	11.75

Note: Viscous oils, 15-25 p.p., generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils **0 to 10 p.p.: Vis. Color**		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200—No. 3	11.50	11.50
250—No. 3	12.50	12.50
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

**Viscous oils, 15 to 30 p.p. are quoted 0.5c lower, 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., are quoted 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis).

Bright Stocks:		
190-200 Vis. at 210° D	22.00	22.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	19.00	19.00
10 to 25 p.p.	18.50	18.50
25 to 40 p.p.	18.00	18.00
150-160 vis. at 210° E	18.00	18.00

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Cylinder Stocks (cont'd)

Prices Effective	Aug. 23	Aug. 16
Mid-Continent (cont'd)		
120 Vis. at 210° D:		
0 to 10 p.p.	18.00	18.00
10 to 25 p.p.	17.50	17.50
25 to 40 p.p.	17.00	17.00
600 S.R. Dark Green	5.00 – 7.50	5.00 – 7.50
600 S.R. Olive Green	7.00 – 9.50	7.00 – 9.50
631 S.R.	‡16.00	‡16.00
Black Oil	3.50 – 4.00	3.50 – 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	20.75	20.75
15 to 25 p.p.	20.25	20.25
30 to 40 p.p.	19.75	19.75
E filtered Cyl. Stock	15.50	15.50

To obtain prices delivered in Chicago, add 0.25c per gal.

‡Only one refiner quoting.

Prices Effective	Aug. 23	Aug. 16
WESTERN PENNA.		
600 S.R. filterable	14.00 –14.50	14.00 –14.50
650 S.R.	16.50 –17.00	16.50 –17.00
600 fl.	17.50 –18.00	17.50 –18.00
630 fl.	21.50 –22.00	21.50 –22.00
600 Warren E	17.50 –18.00	17.50 –18.00
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	24.00 –24.50	24.00 –24.50
15 p.t.	23.00 –23.50	23.00 –23.50
20 p.t.	22.00 –22.50	22.00 –22.50
25 p.t.	21.00 –21.50	21.00 –21.50

Petrolatums

WESTERN PENNA. (Per lb., in barrels, carload lots. In tank cars, 0.5c per lb. less).

Snow white	6.625– 6.75	6.625– 6.75
Lily White	5.625– 5.75	5.625– 5.75
Cream White	4.625– 4.75	4.625– 4.75
Light Amber	2.75 – 2.875	2.75 – 2.875
Amber	2.50 – 2.625	2.50 – 2.625
Red	2.125– 2.375	2.125– 2.375

Wax

Prices Effective	Aug. 23	Aug. 16
WESTERN PENNA. (Per lb., f.o.b. N. Y. basis)		
122-124 w.c. scale, A.m.p.	2.95	2.95
124-126 w.c. scale, A.m.p.	2.95 – 3.00	2.95 – 3.00
OKLAHOMA (Per lb. in bbls.; in a few instances, per lb. in burlap bags).		
124-126 w.c. scale, A.m.p.	3.00 – 3.125	3.00
CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)		
Fully refined:		
122-124	4.65 – 4.75	4.65 – 4.75
125-127	4.90 – 5.00	4.90 – 5.00
127-129	5.05 – 5.15	5.05 – 5.15
130-132	**5.45 – 5.55	**5.45 – 5.55
132-134	**5.70 – 5.80	**5.70 – 5.80
135-137	**6.45 – 6.55	**6.45 – 6.55

**Same prices quoted in bags or slabs loose.

MID-WESTERN TANK CAR MARKET

Prices are those made by Chicago sellers, on Group 3 (Oklahoma) freight basis, although shipments may originate in other South-western or Mid-western refining districts

Gasoline

Prices Effective	Aug. 23	Aug. 16
U. S. Motor:		
62 oct. and below	4.75 – 5.00	4.75 – 5.00
63-67 oct.	5.25 – 5.625	5.25 – 5.625
68-70 oct. (regular)	5.625– 6.00	5.625– 6.00
60-62, 400 e.p.	4.75 – 5.00	4.75 – 5.00
64-66, 375 e.p.	5.125– 5.50	5.125– 5.50
68-70, 350-360 e.p.	5.00 – 5.50	5.00 – 5.50

Kerosine

41-43 w.w.	4.00 – 4.125	4.00 – 4.125
42-44 w.w.	4.00 – 4.375	4.00 – 4.375

*Nominal

‡Only one seller quoting.

Fuel *and* Gas Oils

Prices Effective	Aug. 23	Aug. 16
Domestic:		
No. 1 p.w.	3.875– 4.00	3.875– 4.00
No. 1 straw	3.625– 3.875	3.625– 3.875
No. 2 straw	3.375– 3.625	3.375– 3.625
No. 2 dark	3.125– 3.375	3.125– 3.375
No. 3	3.125– 3.25	3.125– 3.25
No. 4	$1.05 –$1.10	$1.05 –$1.10
No. 5	$0.80 –$0.85	$0.80 –$0.85
Industrial:		
No. 4	$0.95 –$1.10	$0.95 –$1.10
No. 5	$0.80 –$0.85	$0.80 –$0.85

Prices Effective	Aug. 23	Aug. 16
Industrial (cont'd)		
No. 6	$0.70 –$0.75	$0.70 –$0.75
U. G. I. gas oil	2.875– 3.25	2.875– 3.25

Naphtha and Solvent

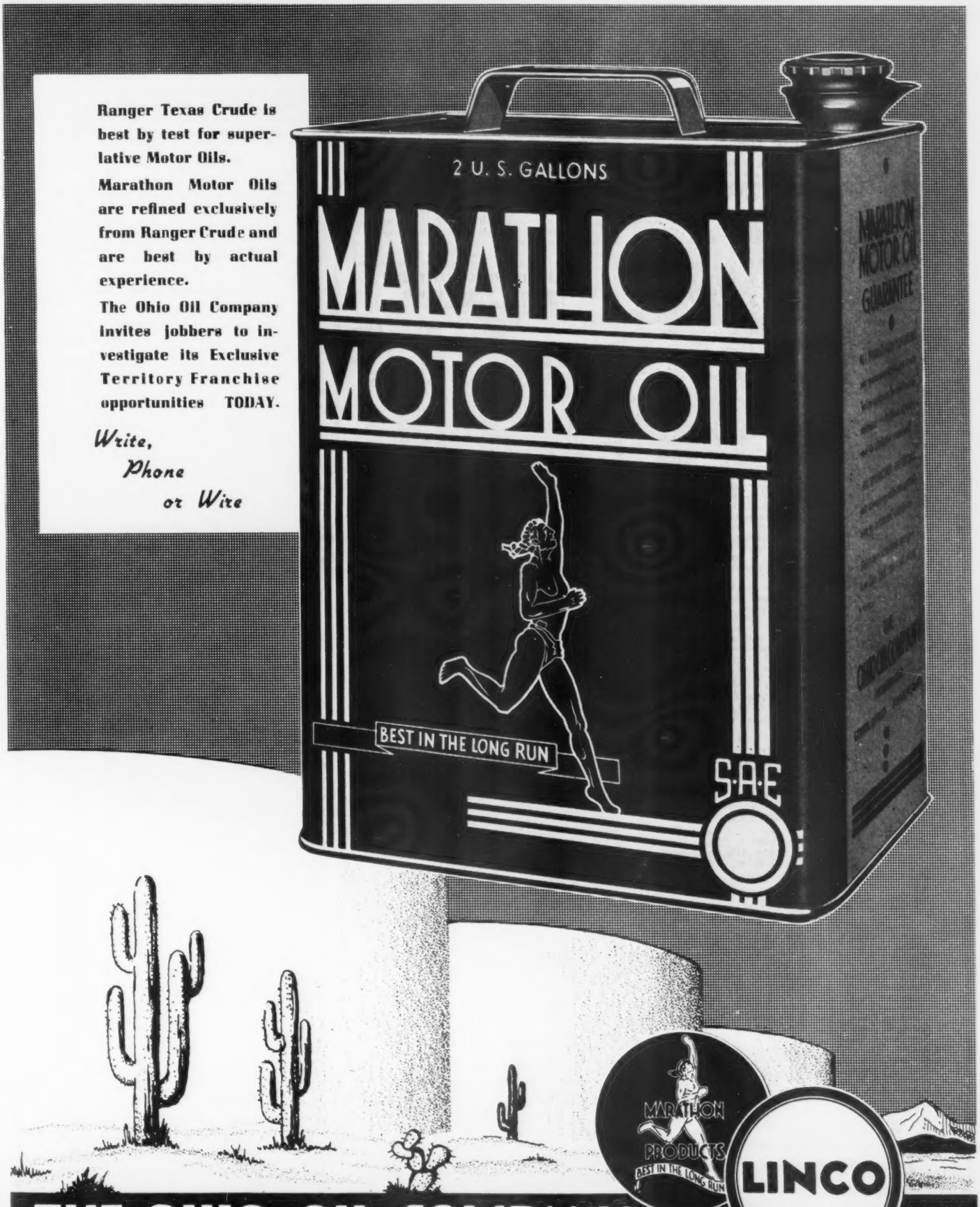
Stoddard solvent	6.875	6.875
Cleaners' naphtha	7.375	7.375
V. M. & P. naphtha	7.375	7.375
Mineral spirits	6.375	6.375
Rubber solvent	7.375	7.375
Lacquer diluent	8.375	8.375

DAILY GASOLINE PRICES

Daily range of gasoline prices as reported in PLATT'S OILGRAM, (Week Ended Aug. 20, 1937)

	Aug. 16	Aug. 17	Aug. 18	Aug. 19	Aug. 20
U. S. Motor, 62 oct. & below:					
*North Texas	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25
West Texas	5.125	5.125	5.125	5.125	5.125
Oklahoma	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
Mid-Western (Group 3 basis)	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
U. S. Motor, 63-67 oct.:					
*North Texas	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625
West Texas	5.50	5.50	5.50	5.50	5.50
Oklahoma	5.375– 5.75	5.375– 5.75	5.375– 5.75	5.375– 5.75	5.375– 5.75
Mid-Western (Group 3 basis)	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625
U. S. Motor, 68-70 oct. (regular)					
*North Texas	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
West Texas	6.125	6.125	6.125	6.125	6.125
Oklahoma	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125
Mid-Western (Group 3 basis)	5.625– 6.00	5.625– 6.00	5.625– 6.00	5.625– 6.00	5.625– 6.00
Motor Gasoline, 60-64 oct.					
New York harbor	†7.50 – 7.75	‡†7.50 – 7.75	‡†7.50 – 7.75	‡†7.50 – 7.75	‡†7.50 – 7.75
Philadelphia district	†7.50	†7.50	†7.50	†7.50	†7.50
Baltimore district	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75
Motor Gasoline, 65 oct. & above					
New York harbor††	†7.75 – 8.00	‡†7.75 – 8.00	‡†7.75 – 8.00	‡†7.75 – 8.00	‡†7.75 – 8.00
Philadelphia district	†7.75	†7.75	†7.75	†7.75	†7.75
Baltimore district	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00
U. S. Motor, 58-62°					
Bradford-Warren (Western Penna.)	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
Other districts (Western Penna.)	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125
Motor Gasoline, Min. 60 oct.					
Bradford-Warren (Western Penna.)	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75
Other districts (Western Penna.)	7.375– 7.75	7.375– 7.75	7.375– 7.75	7.375– 7.75	7.375– 7.75
Motor Gasoline, Min. 65 oct.					
Bradford-Warren (Western Penna.)	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00
Other districts (Western Penna.)	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00

*For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipment.
†Nominal.
‡Some reported moving for New Jersey delivery at 0.25c lower.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TULSA, OKLAHOMA
FT. WORTH, TEXAS

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Aug. 23, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

S. O. New Jersey

ESSOLENE

	Consumer Tank Car	Dealer T.W.	Taxes	Posted S.S.	Kerosine T.W.
Atlantic City, N. J.	8	9.5	4	*	9
Newark, N. J.	8	9.5	4	*	9
Annapolis, Md.	9.1	10.6	5	*	9.5
Baltimore, Md.	8.5	10	5	18.5	9
Cumberland, Md.	9.9	12.4	5	*	10
Washington, D. C.	8	9.5	3	16	9.5
Danville, Va.	9.7	12.2	6	*	12.9
Norfolk, Va.	8.5	11	6	*	11.5
Petersburg, Va.	8.8	11.3	6	*	11.7
Richmond, Va.	8.8	11.3	6	*	11.7
Roanoke, Va.	10	12.5	6	*	12.9
Charleston, W. Va.	9.3	11.8	6	*	12.6
Parkersburg, W. Va.	8.6	11.1	6	*	11.2
Wheeling, W. Va.	9.5	11	6	*	12.2
Charlotte, N. C.	9.9	12.4	7	*	12.6
Hickory, N. C.	10.4	12.9	7	*	13
Mt. Airy, N. C.	10.2	12.7	7	*	12.8
Raleigh, N. C.	9.5	12	7	*	12.1
Salisbury, N. C.	10	12.5	7	*	12.7
Charleston, S. C.	8.5	11	7	*	11.1
Columbia, S. C.	9.5	12	7	*	12.1
Spartanburg, S. C.	10.2	12.7	7	*	12.9

*S. O. New Jersey transferred stations to dealers; no prices available.

Price basis to undivided dealers: Dealer t.w. price less 0.5c per gal.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year, consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

SOCONY MOBILGAS

	Consumer Tank Car	"Split" Dealer T.W.	Taxes	Total "Split" Dealer T.W.	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	8.5	10	*5	15	9
Borough of Richmond (Staten Is.)	8.5	10	*5	15	9
Albany, N. Y.	8.5	10	5	15	9
Binghamton, N. Y.	9.7	10 8	5	15 8	9 5
Buffalo, N. Y.	9.04	10 8	5	15 8	8.5
Jamestown, N. Y.	8.28	10 8	5	15 8	8.25
Plattsburg, N. Y.	8.9	10 9	5	15 9	9 5
Rochester, N. Y.	8.92	10 3	5	15 3	8.5
Syracuse, N. Y.	9.1	10 5	5	15 5	9
Danbury, Conn.	8.8	10 3	4	14 3	9
Hartford, Conn.	8.6	10 6	4	14 6	9
New Haven, Conn.	8.5	10	4	14	9
Bangor, Me.	9.1	11 3	5	16 3	9.5
Portland, Me.	8.5	10 8	5	15 8	8.75
Boston, Mass.	8.5	9 5	4	13.5	8.5
Concord, N. H.	9.2	11 8	5	16 8	9 5
Lancaster, N. H.	10.1	12 8	5	17 8	10.25
Manchester, N. H.	9	11 3	5	16 3	9 5
Providence, R. I.	8.5	10	4	14	8.25
Burlington, Vt.	8.9	10 9	5	15 9	9 5
Rutland, Vt.	9.2	11 2	5	16 2	9.75

*Plus 2% city sales tax computed at time of each sale.

Note: Socony-Vacuum has transferred all service stations to dealers; no prices available.

Price basis to undivided dealers: 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England, for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

ATLANTIC WHITE FLASH GASOLINE

	Commercial Tank Car	All Tax	Total Dealer T.W.	S.S.	Kerosine T.W.
Philadelphia, Pa.	8	5	14.5	18	10.5
Pittsburgh	8.5	5	15.5	20	11
Allentown	8.5	5	15	**	11
Erie	8	5	14.5	**	10
Scranton	8.5	5	15	**	11
Altoona	8.5	5	15.5	**	11
Harrisburg	8.5	5	15	**	11
Williamsport	8.5	5	15.5	**	11
Dover, Del.	...	5	14.5	**	11
Wilmington	...	5	14	**	11
Boston, Mass.	...	4	14	**	8.5
Springfield, Mass.	...	4	14.8	**	9
Worcester, Mass.	...	4	14.8	**	9
Fall River, Mass.	...	4	13	**	8.5
Hartford, Conn.	...	4	14.6	**	9
New Haven, Conn.	...	4	14	**	9
Providence, R. I.	...	4	14	**	8.5
Atlantic City, N. J.	...	4	13.5	**	8.5
Camden, N. J.	...	4	13.5	**	8.5
Trenton, N. J.	...	4	13.5	**	8.5
Annapolis, Md.	...	5	15.6	**	9.5
Baltimore, Md.	...	5	15	**	9
Hagerstown, Md.	...	5	16	**	10
Richmond, Va.	...	6	17.3	**	11.7
Wilmington, N. C.	...	7	18.1	**	11.3
Brunswick, Ga.	...	7	16	**	*13
Jacksonville, Fla.	...	8	17.5	**	11

*Georgia has kerosine tax of 1c per gal., not included in above price.

**Atlantic Refining transferred stations to dealers; no prices available.

Price basis to undivided dealers: Dealer t.w. less 0.5c per gal.

Price basis to commercial consumers: in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases to contract accounts taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment' delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware. 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

SOHIO X-70 GASOLINE

	All Tax	Consumer T.W.	**Commercial T.W.	†Divided Dlr.	Kerosine T.W.
Ohio State-Wide	5	17	15.5	16	*13.5
Defiance county	5	16	‡	15	....
Erie, Fulton, Hamilton, Henry, Lucas, Ottawa, Sandusky, Williams & Wood counties	5	17	‡	16	....
Counties where prices are below statewide:					
Columbiana	5	16.5	15	15.5	....
Franklin, Knox and Pickaway	5	16	14.5	15	....
Paulding	5	15.5	14	14.5	....

RENOWN GASOLINE (Third Grade)

Ohio State-Wide	5	16.5	15	15.5	....
Defiance county	5	15.5	‡	14.5	....
Erie, Fulton, Lucas, Ottawa, Sandusky, Williams and Wood	5	16.5	‡	15.5	....
Hamilton county	5	17	‡	16	....
Counties where prices are below statewide:					
Columbiana	5	16	14.5	15	....
Franklin, Knox, and Pickaway	5	15.5	14	14.5	....
Paulding	5	15	13.5	14	....
Counties where prices are above statewide: Butler, Clermont, Darke, Greene, Hocking, Miami, Montgomery, Preble and Warren	5	17	15.5	16	....

S. O. Ohio Cont'd

KEROSINE PRICES

(Off Statewide Level)

Kerosine prices are off statewide level in the following counties:

Gallia and Washington	*13
Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hancock, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull, Union, Van Wert and Wyandot:	*12.5
Paulding	*12
Ashtabula	*11.5
Fayette, Licking, Madison, Pickaway, Portage and Summit	*9.5

*Kerosine prices include 1c state tax.

**Tank wagon price to commercial consumers, in t.w. deliveries of 25 gals. or more; less than 25-gal. deliveries get s.s. price. Price to undivided dealers is same as to commercial consumers.

Discounts to Commercial Consumers on contract: Effective Aug. 12, thru Ohio, for 20,000 gals. of gasoline or more per month, 1c per gal. off commercial consumer t.w. price. For counties where no commercial t.w. is posted, see following paragraph.

‡Commercial consumer t.w. posted price discont'd and Q.D.A. to t.w. consumers put into effect July 19, 1937, in counties of Defiance, Erie, Fulton, Hamilton, Henry, Lucas, Ottawa, Sandusky, Williams and Wood. For further information, write National Petroleum News.

†This price also to authorized agents, exclusive of 0.5c rental.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices", S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on state-wide level.

S. O. Kentucky

CROWN GASOLINE

(Regular Grade)

	Consumer T.W.	All Tax	Total Consumer T.W.	Net Dlr.	Kerosine T.W.
Covington, Ky.	13.5	6	19.5	16.5	11
Lexington, Ky.	14	6	20	17	11
Louisville, Ky.	14	6	20	17	10.5
Paducah, Ky.	14	6	20	17	8
Jackson, Miss.	14	7	21	18	*13
Vicksburg, Miss.	13.5	7	20.5	17.5	*13
Birmingham, Ala.	11.5	*8	19.5	16.5	12
Mobile, Ala.	13	*9	22	19	11
Montgomery, Ala.	13	*9	22	19	*14.5
Atlanta, Ga.	15	7	22	19	*13
Augusta, Ga.	14	7	21	18	*14
Macon, Ga.	14.5	7	21.5	18.5	*14.5
Savannah, Ga.	12	7	19	16	*12
Jacksonville, Fla.	12.5	8	20.5	17.5	11
Miami, Fla.	12.5	8	20.5	17.5	11.5
Pensacola, Fla.	13	*9	22	19	12
Tampa, Fla.	11	8	19	16	10.5

KYSO GASOLINE

(Third Grade)

Covington, Ky.	12	6	18	15.5	....
Lexington, Ky.	12.5	6	18.5	16	....
Louisville, Ky.	12	6	18	15.5	....
Paducah, Ky.	12	6	18	15.5	....
Jackson, Miss.	12.5	7	19.5	17	....
Vicksburg, Miss.	12	7	19	16.5	....
Birmingham, Ala.	10	*8	18	15.5	....
Mobile, Ala.	10.5	*9	19.5	17	....
Montgomery, Ala.	10.5	*9	19.5	17	....
Atlanta, Ga.	13	7	20	17.5	....
Augusta, Ga.	12	7	19	16.5	....
Macon, Ga.	10.5	7	17.5	15	....
Savannah, Ga.	10.5	7	17.5	15	....
Pensacola, Fla.	11	*9	20	17.5	....

Discounts to tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below.

Discounts on kerosine: Prices in Kentucky are net, but in other states subject to 2c discount.

**Taxes*: in the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Mississippi kerosine prices include 1c state tax. Montgomery kerosine price includes 1c city tax.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/2c per gal. in a single barrel; 3/10c per gal. in lots of 2 to 10 bbls., 1/5c for 10 to 50 bbls., 2/25c for over 50 bbls.; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal., in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fee only: Iowa, 2/25c; Michigan, 4/5c per gal. for first 2 bbls.; 3/5c for next 3; 2/5c for next 5; 3/10c for next 15, and 1/5c per gal. in lots over 25 bbls.

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Aug. 23, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

S. O. Indiana

	Red Crown Tax	Dealer Prices Red Crown T.W.	Stanolind T.W.	Kerosine T.W.
Chicago, Ill	4	15.5	13.5	12	10.1
Decatur, Ill	4	15.5	14	12	10.1
Joliet, Ill	4	15.5	14	13.5	10.1
Peoria, Ill	4	15.5	14	13.5	10.1
Quincy, Ill	4	15.3	13.8	13.3	9.9
Indianapolis, Ind	5	17.2	15.7	14.7	*14.8
Evansville, Ind	5	17	15.5	13	*14.6
South Bend, Ind	5	17.4	15.9	15.4	*13.6
Detroit, Mich	4	15.4	13.9	13.4	9.8
Grand Rapids, Mich	4	16.5	15	14.5	10.9
Saginaw, Mich	4	16.3	14.8	14.3	8.5
Green Bay, Wis	5	17.2	15.7	14.7	10.8
Milwaukee, Wis	5	16.8	15.3	14.2	10.4
La Crosse, Wis	5	16.9	15.4	14.9	10.5
Minneapolis-St. Paul	5	16.9	15.4	14.9	10.5
Duluth, Minn	5	17.3	15.8	15.3	10.9
Mankato, Minn	5	16.9	15.4	14.9	10.5
Des Moines, Ia	4	15.3	13.8	13	*12.9
Sioux City, Ia	4	15.5	14	13.5	*13.1
Davenport, Ia	4	15.5	14	13.5	*13.1
Mason City, Ia	4	15.7	14.2	13.7	*13.3
St. Louis, Mo	*4	15.2	13.7	11.2	9.8
Kansas City, Mo	*4	14.9	13.4	12.9	8
St. Joseph, Mo	*4	14.9	12.4	12	8.5
Fargo, N. D.	4	16.9	15.4	14.9	11.5
Minot, N. D.	4	18.1	16.6	16.1	12.7
Huron, S. D.	*5	17.3	15.8	15.3	*10.9
Wichita, Kans	4	14.4	12.9	12.4	8

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax; South Dakota, 0.1c sales tax. State Kerosine taxes: Indiana, 4c; Iowa, 3c, all included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

STANDARD RED CROWN GASOLINE

	All Tax	T.W. Total	Dealer Total	Kerosine T.W.
Omaha, Neb	6	17.9	16.4	10.4
McCook	6	18	17.1	10
Norfolk	6	18.3	16.8	10.8
North Platte	6	18.7	17.2	11.2
Scottsbluff	6	19.4	15.9	11.9

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

ESSOLENE

	Consumer Tank Car	Dealer T.W.	Taxes	Posted S.S.	Kerosine T.W.
Little Rock, Ark	8.5	11	7.5	**	11.5
Alexandria, La	8.5	11	8	**	*12
Baton Rouge, La	8	10.5	8	22	*12
New Orleans, La	8	10.5	*10	24	*13
Lake Charles, La	9	11.5	8	**	*12.5
Shreveport, La	7.5	10	8	**	*9.5
Lafayette, La	9	11.5	8	**	*13
Bristol, Tenn	11	12.25	8	**	14.5
Chattanooga, Tenn	10.5	13	8	**	13.5
Knoxville, Tenn	11	13.5	8	**	14
Memphis, Tenn	9	11.5	8	**	12
Nashville, Tenn	10	12.5	8	**	11

*New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana kerosine prices include 1c state tax; in addition New Orleans has 1c parish tax.

**S. O. Louisiana transferred stations to dealers; no prices available.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

HUMBLE MOTOR FUEL

	*100% Dlr. T.W.	Taxes	Total *100% Dlr. T.W.	S.S.	Kerosine T.W.
Dallas, Tex	8.5	5	13.5	17	8
Ft. Worth, Tex	9	5	14	18	8
Houston, Tex	9.5	5	14.5	18.5	8
San Antonio, Tex	9.5	5	14.5	18.5	8
(Third Grade)					
Dallas, Tex	7	5	12	14	
Ft. Worth, Tex	8	5	13	16	
Houston, Tex	8.5	5	13.5	16.5	
San Antonio, Tex	8.5	5	13.5	16.5	

*Price is t.w. price to contract dealers and commercial consumers. Price to open dealers is 0.5c above t.w. prices shown above.

Price basis to dealers: to contract dealers consumer accounts off posted retail price: when posted retail price, including all taxes on Esso motor fuel is: 19.1c per gal. and above discount is 4c; 19c to 18.1c, 3.5c, and 18c and below, 3c. Humble motor fuel, 17.1c and above, 4c; 17 to 16.1c, 3.5c; and 16c and below, 3c; U. S. motor fuel, 15.1c and above, 3c; 15 to 14.1c, 2.5c; and 14c and below, 2c. To "open" dealer accounts, discounts in each case are 0.5c less on the same price basis.

Continental Oil

	Conoco Bronze Ex-Tax	All Tax	Dealer Prices Total Conoco Bronze	Demand	Kerosine T.W.
Denver, Colo	12.5	5	17.5	16.5	11.5
Grand Junc., Colo	15	5	20	19	15
Pueblo, Wyo	12.5	5	17.5	16.5	10.5
Casper, Wyo	13	5	18	17	11.5
Cheyenne, Wyo	13	5	18	17	13
Billings, Mont	14	6	20	18	15.5
Butte, Mont	13.5	6	19.5	16.5	15.5
Great Falls, Mont	15.5	6	21.5	20.5	15.5
Helena, Mont	15.5	6	21.5	20.5	15.5
Salt Lake City, Utah	14.5	5	19.5	16.5	16
Boise, Ida	15.5	6	21.5	20.5	18
Twin Falls, Ida	15.5	6	21.5	20.5	18
Albuquerque, N. M.	11	†6.5	17.5	16.5	12
Roswell, N. M.	12	†6.5	18.5	15	10.5
Santa Fe, N. M.	13	*7	20	16.5	12
Muskogee, Okla	10	5	15	13	7
Oklahoma City, Okla.	9	5	14	11	8
Tulsa Okla	9	5	14	13	7
Ft. Smith, Ark	10.5	5	15.5	13.5	10
Little Rock, Ark	10.5	7.5	18	16	9.5
Texarkana, Ark	10.5	5	15.5	13.5	8.5

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

STANDARD GASOLINE

	T.W.	Taxes	Total T.W.	S.S.	Kerosine T.W.
San Francisco, Cal	13.5	4	17.5	18.5	11.5
Los Angeles, Cal	13	4	17	18	9
Fresno, Cal	14.5	4	18.5	19.5	12
Phoenix, Ariz	15	6	21	22	†16
Reno, Nev	15	5	20	21	13
Portland, Ore	14	6	20	21	13.5
Seattle, Wash	14	6	20	21	13.5
Spokane, Wash	17	6	23	24	16.5
Tacoma, Wash	14	6	20	21	13.5

FLIGHT GASOLINE
(Third Grade)

San Francisco, Cal	12	4	16	17	....
Los Angeles, Cal	11.5	4	15.5	16.5	....
Fresno, Cal	13	4	17	18	....
Reno, Nev	13.5	5	18.5	19.5	....
Phoenix, Ariz	13.5	6	19.5	20.5	....
Portland, Ore	12.5	6	18.5	19.5	....
Seattle, Wash	12.5	6	18.5	19.5	....
Spokane, Wash	15.5	6	21.5	22.5	....
Tacoma, Wash	12.5	6	18.5	19.5	....

†Includes 5c state tax.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price: on single deliveries of 40 gallons and over, Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price.

On kerosine in tank car, transport truck and trailer delivery, 3c off t.w. price; plant deliveries to jobbers, 2.5c below t.w.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-STAR IMPERIAL GASOLINE

	T.W.	Taxes	Total T.W.	Kerosine T.W.
Hamilton, Ont	16	6	22	17
Toronto, Ont	16	6	22	17
Brandon, Man	22.8	7	29.8	22.3
Winnipeg, Man	21.2	7	28.2	20.7
Regina, Sask	22.5	7	29.5	22
Saskatoon, Sask	25.3	7	32.3	24.8
Edmonton, Alta	23.5	7	30.5	24.2
Calgary, Alta	21	7	28	21.5
Vancouver, B. C.	16	7	23	23
Montreal, Que	15	6	21	17.5
St. John, N. B.	16	8	24	18.5
Halifax, N. S.	16	8	24	18.5

Note: Imperial Oil Ltd. has completed transfer of service stations to dealers; no s.s. prices available.

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car and/or tank wagon prices of aviation gasoline in principal marketing territories (Stanavo aviation in all territories except Continental Oil and unless otherwise noted). Tax column includes 1c federal tax, and state tax; also municipal taxes as indicated in footnotes. Prices in first four territories do not include state or federal taxes.

S. O. NEW JERSEY

	*Ethyl T.C.	Tank Car	T.W.
Bayonne, N. J.	19.5	9.5	12.5
Baltimore, Md	....	10	12.5
Washington, D. C.	....	....	13.1
Richmond, Va	....	....	15.2
Greensboro, N. C.	....	....	15.7
Raleigh, N. C.	....	....	17.1
Charleston, W. Va	....	....	15.2

*This is Stanavo Ethyl Aviation Gasoline, 100 octane number, tank car price.

COLONIAL BEACON OIL CO.

	T.W.
Brooklyn, N. Y.	12.8
Buffalo, N. Y.	14.1
Boston, Mass	15

S. O. PENNSYLVANIA

Philadelphia, Pa	12.8
Pittsburgh, Pa	13.1

S. O. LOUISIANA

New Orleans, La	13.8
Shreveport, La	14.1

Prices in above four territories are on a 74 octane grade aviation gasoline except where otherwise noted. An 80 octane product generally brings 0.5c premium and an 87 octane product, 1.5c premium over the 74 octane grade.

Note: S.s. prices in above four territories are generally 6c over t.w. prices. Above t.w. prices are net, with no discounts allowed for quantity purchases. T.w. prices are generally tank car price, plus freight, plus 2.5c per gal.

S. O. OHIO
Thru Ohio

	Consumer T.W.	Tax	Total Consumer T.W.
Stanavo Ethy Aviation:			
73 octane	15.5	5	20.5
80 octane	16.5	5	21.5
87 octane	17.5	5	22.5

Discounts: For delivery on contract to hangar operators and resellers: 2c below commercial consumer posted t.w. price, shown above.

S. O. INDIANA

Chicago, Ill	15	4	19
Detroit, Mich	16.2	4	20.2
Milwaukee, Wisc	15.3	5	20.3
Minneapolis, Minn	15.4	5	20.4
St. Louis, Mo	14.7	*3	17.7
Kansas City, Mo	14.4	*4	18.4
Fargo, N. D.	16.4	4	20.4
Huron, S. D.	15.8	5	20.8

*Includes 1c city tax.
**Includes 0.1c to cover.

HUMBLE OIL & REFINING CO.

	Tank Car
Baytown, Tex. (exclusive of taxes)	8.5

CONTINENTAL OIL CO.

	Dealer	Tax	Total Dealer
Denver, Colo	15.5	5	20.5
Cheyenne, Wyo	16	5	21
Helena, Mont	18.5	6	24.5
Salt Lake City, Utah	17.5	5	22.5
Albuquerque, N. M.	14	*6.5	20.5

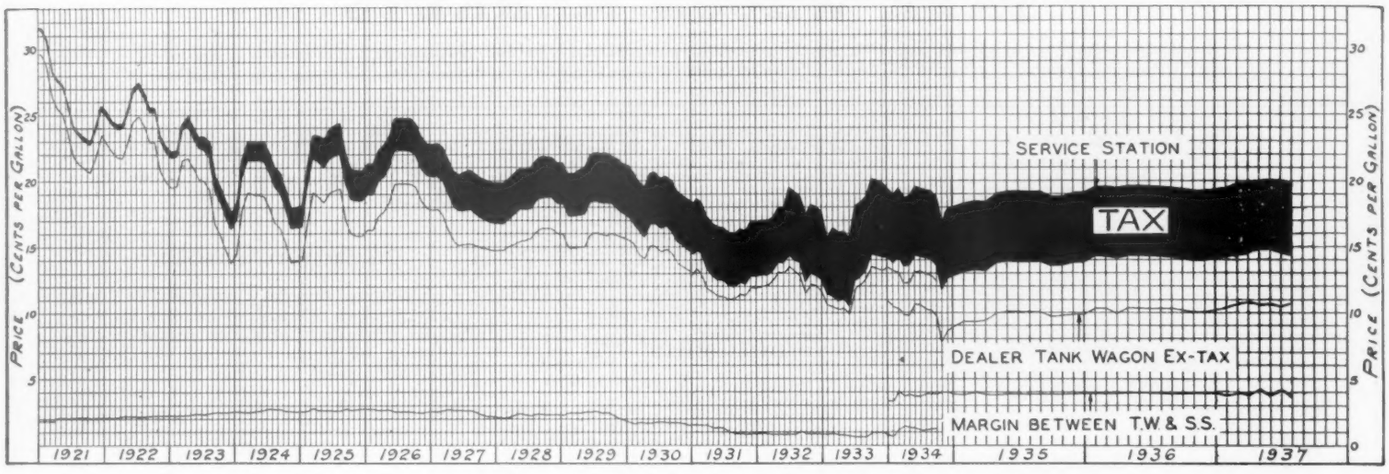
*Includes city tax of 0.5c.

S. O. CALIFORNIA

Phoenix, Ariz	17	6	23
Los Angeles, Cal	15	4	19
San Francisco, Cal	15.5	4	19.5
Reno, Nev	17	5	22
Portland, Ore	16	6	22
Seattle, Wash	16	6	22
Spokane, Wash	19	6	25

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Trend of Gasoline Prices and Gasoline Taxes, at 50 Representative Cities



TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Aug. 23, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

Posted Tank Wagon Prices

	Mineral Spirits	V.M.&P.
Newark, N. J.	12.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	13	14
New York City	11	12
Rochester, N. Y.	12	15
Syracuse, N. Y.	14	15
Boston, Mass.	13.5	14
Bridgeport, Conn.	13.5	14
Hartford, Conn.	13	13.5
Providence, R. I.	13.5	14.5

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	13.25	13.75

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Staniso
Chicago, Ill.	15.8	16.1	15.5
Detroit, Mich.	19.2	18.2	19.3
Kansas City, Mo.	14.4	15.4	14.4
St. Louis, Mo.	14.7	15.7	14.6
Milwaukee, Wis.	19.3	20.3	19.3
Minneapolis, Minn.	19.4	20.4	18

Note: Prices for V. M. & P. apply also to Light Cleaners Naphtha. All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	11	10
New York Harbor	11	9.5–10
Philadelphia district	11	10
Boston	10.5	10
Providence	10.5	10
Ohio points, delivered	9.75	*9.25

*This is on S.R. solvent.
Note: In Ohio, prices on D.C. naphtha and special Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P.

Latest Changes

From Aug. 17 to Aug. 23 inclusive. Dates and amounts of changes shown. See table for full current prices.

S. O. Indiana—Kerosine:

St. Joseph, up 1.1c, Aug. 19.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

S. O. Indiana—Kerosine:

Indianapolis, up 1.2c, Aug. 9.

Diesel Car Presents Problem To British Stations

LONDON—The first diesel-motored family automobile to be offered by a popular manufacturing concern to the British public as a standard model has just made its debut in London. Citroen, the big French firm, which has for several years built cars at Slough, near London, for the British market, is producing the new car. It is a seven-seater saloon model with a lightweight high-speed diesel motor.

The new motor will be exhibited for the first time at the London Automobile Show in October. It is a compact unit of 75 mm. bore and 100 mm. stroke, developing 40 brake horsepower at maximum engine speed of 3,500 revolutions per minute. Compared with the ordinary Citroen seven-seater car, the diesel model costs $450 more, or $1,875 against $1,425. Saving on fuel cost is claimed to be 40 per cent.

The marketing of the new car, which is probably only the first of many diesel cars that will appear during the next few years, has brought to the front the difficulty of obtaining supplies of fuel.

At present there are very few filling stations in the United Kingdom equipped with pumps serving diesel oils. Special arrangements will have to be made with the oil distributing organizations, and it is understood that the Citroen company has started negotiations with this object in view. By the opening of the London Automobile Show, it is expected that a certain number of filling stations in the metropolis will have had diesel oil pumps installed.

Hunt Leaves Michigan P. I. C.

MT. PLEASANT, Mich., Aug. 23.—Henry H. Hunt, secretary of the Michigan Petroleum Industries Committee here for the past several years, has resigned to join the Lupher Drilling Co., Columbus, O.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	Aug. 23	
District:	*60-64 Oct.	*65 Oct. & Above
N. Y. harbor	‡7.50 – 7.75	‡7.75 – 8.00
†N. Y. harbor	7.25 – 7.50	7.50 – 7.75
Philadelphia	7.50	7.75
Baltimore	7.50 – 7.75	7.75 – 8.00
Norfolk	7.50 – 7.75	7.75 – 8.00
Wilmington, N. C.	7.50 – 7.75	7.75 – 8.00
Charleston, S. C.	7.50 – 7.75	7.75 – 8.00
Savannah	7.25	7.50
Jacksonville	7.25	7.50
Portland	7.75	8.00
Boston	7.25 – 7.50	7.50 – 7.75
Providence	7.25 – 7.50	7.50 – 7.75

*Prices are nominal. †Barge lots.
‡Some reported moving for New Jersey delivery at 0.25c lower.

WATER WHITE KEROSINE

District:			
N. Y. harbor	6.30	Charleston, S. C.	6.25
*N. Y. harbor	6.125	Savannah	6.25
Philadelphia	6.25	Jacksonville	6.25
Baltimore	6.25	Portland	6.75
Norfolk	6.25	Boston	6.40
Wilmington, N. C.	6.25	Providence	6.30 – 6.40

*Barge lots.

†FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	6.30	6.125
Nos. 2-3	5.25	5.125
No. 4	5.25	5.125
No. 5	$1.55 –$1.60	.....
No. 6	$1.35	.....

	Phila. dist.	Balt. dist.
No. 1	6.25	6.25
Nos. 2-3	5.00	5.25
No. 4	4.75 – 5.00	5.25
No. 5	$1.475–$1.55	$1.55
No. 6	$1.30 –$1.35	$1.35

	Bost. dist.	Prov. dist.
No. 1	6.40	6.30 – 6.40
Nos. 2-3	5.40	5.40
No. 4	5.40	5.40
No. 5	$1.55 –$1.60	.....
No. 6	$1.35	.....

†Fuel oils meet specifications of U. S. Commercial Standards CS12-35.

District:	†Bunker C Fuel	†Diesel Oil
N. Y. harbor	*$1.35	**$2.20
Philadelphia	*$1.30 –$1.35	**$2.20
Baltimore	*$1.35	**$2.20
Norfolk	*$1.35	$2.20
Charleston	$1.30	$2.20
Savannah	*$1.30	$2.20
Jacksonville	*$1.30	$2.20
Tampa	*$1.30	$2.20
Portland	$1.45	$2.35
Boston	*$1.35	**$2.25
Providence	$1.35	$2.25

†In ships' bunkers.

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	5.25	5.25
Philadelphia dist.	5.00	....
Baltimore dist.	5.25	....
Norfolk dist.	5.25	....
Savannah dist.	....	5.25
Jacksonville dist.	....	5.25

*For barging add 5c per bbl.
**For barging add 6.5c per bbl.

Pacific Export

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Aug. 23	Aug. 16
U. S. Motor, under 65 oct.	6.00 – 6.125	6.00 – 6.125
400 e.p. blend 65 oct. & above	6.125– 6.25	6.125– 6.25
*38-40 w.w. kerosine	4.50 – 4.75	4.50 – 4.75
41-43 w.w. kerosine	4.75 – 5.00	4.75 – 5.00
44 w.w. kerosine	5.00	5.00

*150 fire point.

Prices Effective	Aug. 23	Aug. 16
In Cargo lots, per bbl.		
Diesel fuel, 24° & above	$1.15 –$1.26	$1.15 –$1.26
Diesel fuel, under 24°	$1.10 –$1.15	$1.10 –$1.15
*30-34 diesel (gas oil)	$1.30 –$1.40	$1.30 –$1.40
†Grade C fuel oil	$0.85 –$1.05	$0.85 –$1.05

Note: For San Francisco cargo prices, add 5c per bbl. to above cargo prices.

In Ships' Bunkers, or deep tank lots, per bbl.:		
*Diesel fuel oil	$1.625–$1.65	$1.625–$1.65
†Grade C fuel oil	$1.075–$1.10	$1.075–$1.10

*Pacific specification 200. †Pacific specification 400.

Cased Goods: (Per case)		
U. S. Motor	$1.40 –$1.525	$1.40 –$1.525
400 e.p. blend, 65 oct. & above	$1.50 –$1.625	$1.50 –$1.625
*40-43 w.w. kerosine	$1.25 –$1.325	$1.25 –$1.325
Kerosine, p.w.	$1.20 –$1.30	$1.20 –$1.30

*150 fire point.

New York Export

(Prices in cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	28.50 –29.00	28.50 –29.00
Dark, 25 p.t.	28.00 –28.50	28.00 –28.50
Neutral oil:		
200 3 color, 25 p.t.	32.00 –32.50	32.00 –32.50
150 3 color, 25 p.t.	27.50 –28.00	27.50 –28.00
600 Warren E filtered	25.00 –25.50	25.00 –25.50
600 s.r., unfiltered	21.50 –22.00	21.50 –22.00
650 s.r., unfiltered	24.00 –24.50	24.00 –24.50
600 fl., s.r.	25.00 –25.50	25.00 –25.50
630 fl., s.r.	29.00 –29.50	29.00 –29.50

Wax, Domestic *and* Export

(Prices in cents per lb. Tests made by A. S. T. M. methods. Melting points shown below, however, are A. M. P., 3° higher than A. S. T. M. (E. M. P.) melting points. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans districts, in bags, carload lots, with 0.2c discount allowed for shipment in bulk. Scale, solid and fully refined, slabs in bags.)

Prices Effective	Aug. 23	
	New York	
	Domestic	Export
124-6 Y.C. scale	2.85 – 2.90	2.85 – 2.90
122-4 W.C. scale	2.95 – 3.00	2.95 – 3.00
124-6 W.C. scale	2.95 – 3.00	2.95 – 3.00
123-5 Fully rfd.	4.45	4.375
125-7 Fully rfd.	4.55	4.50
128-30 Fully rfd.	4.80	4.75
130-2 Fully rfd.	5.05	5.00
133-5 Fully rfd.	†5.50	5.50
135-7 Fully rfd.	†5.75	5.75
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	2.85 – 2.90	2.85 – 2.90
122-4 W.C. scale	2.95 – 3.00	2.95 – 3.00
124-6 W.C. scale	2.95 – 3.00	2.95 – 3.00
123-5 Fully rfd.	4.45	4.375
125-7 Fully rfd.	4.55	4.50
128-30 Fully rfd.	4.80	4.75
130-2 Fully rfd.	5.05	5.00
133-5 Fully rfd.	†5.50	5.50

†Shipment either in bags or in bulk.

Gulf Coast

(Prices are f.o.b. ship at Gulf oil terminals representing opinions of traders, except prices specified to the contrary. Prices cover bulk shipments of 20,000 bbls. or more, unless otherwise noted.)

Prices Effective	Aug. 23	Aug. 16
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	*6.125	*6.125
60-64 oct. number	*6.25	*6.25
65 oct. & above	6.50 – 6.625	6.50 – 6.625
FUEL OILS		
No. 1	5.00	5.00
No. 2	4.125– 4.25	4.125
No. 4	4.00	4.00
KEROSINE		
41-43 w.w.	5.00	5.00
For Export Shipment:		
GASOLINE		
U. S. Motor	6.125	6.125
60-62, 400 e.p.	6.125	6.125
61-63, 390 e.p.	6.25	6.25
64-66, 375 e.p.	6.375	6.375

*Nominal.

Prices Effective	Aug. 23	Aug. 16
KEROSINE		
44 w.w.	5.375	5.125– 5.25
41-43 w.w.	5.00	5.00
41-43 p.w.	4.875	4.875
GAS AND BUNKER OILS		
For Domestic and/or Export Shipment		
‡26-30 translucent gas oil	4.00 – 4.125	4.00 – 4.125
‡30 plus translucent gas oil	4.125– 4.25	4.125– 4.25
‡30 plus transparent gas oil	4.25	4.125– 4.25
Diesel Oil Ship's bkrs.	†$1.90	†$1.90
Grade C bunker oil, for ship's bunkers	†$1.05	†$1.05
Grade C bunker oil, in cargoes	$0.95	$0.95

‡Less than ½ of 1% sulphur. †Barging 5c bbl. additional at some Gulf ports.

MEXICAN CRUDE AND BUNKER OILS
(F.o.b. Steamer, Tampico)

Heavy Panuco crude, taxes to be paid	*$1.15 –$1.20	*$1.15–$1.20
Grade C bunker oil, ship's bunkers, taxes paid	$1.05	$1.05

MID-CONTINENT LUBRICATING OILS

(Prices in cents per gal. in bbls. f.a.s. Gulf oil terminals. In drums and new barrels, 0.5c to 1c higher per gal. in some instances.)

190-200 vis. D 210 brt. stock	27.50	27.50
150-160 vis. D 210 l.t. stock:		
0-10 p.p.	24.50	24.50
10-25 p.p.	24.00	24.00
25-40 p.p.	23.50	23.50
150-160 vis. E 210 brt. stock	23.50	23.50
120 vis. D 210 brt. stock	22.50	22.50
180 vis. No. 3 color neutral:		
0-10 p.p.	16.50	16.50
15-30 p.p.	16.00	16.00
200 vis. No. 3 color neutral:		
0-10 p.p.	17.00	17.00
15-30 p.p.	16.50	16.50
600 s.r. olive green	12.50	12.50
600 s.r. dark green	11.00	11.00
631 s.r.	22.50	22.50

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° F., pour point 0. Tanker, f.o.b. Gulf oil terminals, for export shipment.)

Unfiltered Pale Oils:		
Vis. Color		
100 No. 3	5.50 – 5.75	5.50 – 5.75
200 No. 3	7.25 – 7.50	7.25 – 7.50
300 No. 3	7.75 – 8.00	7.75 – 8.00
500 No. 3½	8.50 – 8.75	8.50 – 8.75
750 No. 4	9.25 – 9.50	9.25 – 9.50
1200 No. 4	9.75 –10.00	9.75 –10.00
2000 No. 4	10.25 –10.50	10.25 –10.50
Red Oils:		
Vis. Color		
100 No. 5-6	5.50 – 5.75	5.50 – 5.75
200 No. 5-6	7.25 – 7.50	7.25 – 7.50
300 No. 5-6	7.75 – 8.00	7.75 – 8.00
500 No. 5-6	8.50 – 8.75	8.50 – 8.75
750 No. 5-6	9.25 – 9.50	9.25 – 9.50
1200 No. 5-6	9.75 –10.00	9.75 –10.00
2000 No. 5-6	10.25 –10.50	10.25 –10.50

Note: Red oil prices shown above cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 lbs., British sterling; to U. S. ports in cents per bbl.)

Rates Effective Aug. 23

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.‡	26/6	25/-26/	27/6	27/6-28/
Auruba-U.K./Cont.‡	21/	21/-22/	23/	24/-25/
Gulf-N. Atlantic** (not E. of N. Y.):				
Hvy. Crude & Fuel, (10 to 19.9 gravity)	34.5c	34c	....	....
Light Crude, (30 Grav. or Lighter)	30c	30c	....	....
Gasoline	....	....	33c	32c
Kerosine	....	....	33c	32c
Light Fuel	....	....	33c	32c

Note: Dirty boat quotations are enlarged to cover, "Fuel and Light Crude" quotations.

‡Continental ports in range between Bordeaux and Hamburg, both inclusive.

**Venezuela loading same rate; Tampico 2c to 3c per bbl. additional.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective June 7, 1937, except Corning Jan. 29, 1937)

Penna. Grade Oil in Southwest Penna. Pipe Lines $2.57
Penna. Grade Oil in Eureka Pipe Lines (West Virginia) $2.52
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.) $2.37
Corning Oil in Buckeye Pipe Lines (Ohio) ... $1.42

Posted by Other Companies

Tide Water Pipe Co., Ltd.
Bradford-Allegany district (Penna. and N. Y.) (Effective June 7, 1937) $2.82
*The Pennzoil Co.: (Effective June 7, 1937)
Penna. Grade Oil in National Transit Lines *$2.82
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.): (Effective Jan. 28, 1937)
Big Sandy River $1.42
Kentucky River $1.50

*The Pennzoil Co. posts $2.82 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $2.77 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (July 23, 1937) ... $1.27

Posted by Simrall Pipe Line Corp.

(Effective July 22, 1937)
West Branch, Arenac, and equal grades $1.09
(Effective July 23, 1937)
Beaverton, Crystal, Greendale, Porter and equal grades $1.27
Buckeye $1.245
(Effective July 1, 1937)
Billings and Tobacco $1.395

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Illinois, Princeton $1.35
Lima $1.25
Owensboro (Western Ky.) $1.40

Posted by Stoll Oil Refining Co.

(Effective Feb. 1, 1937)

Stoll Pipe Line Oil (Ky.) $1.40

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario

(Effective Sept. 9, 1933)

Petrolia $2.10
Oil Springs $2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)
(Effective Dec. 16, 1936)

Clear Naphtha $2.60

Crude Oil & Discolored Naphtha

40-40.9°	$1.55	53-53.9	$1.94
41-41.9	1.58	54-54.9	1.97
42-42.9	1.61	55-55.9	2.00
43-43.9	1.64	56-56.9	2.03
44-44.9	1.67	57-57.9	2.06
45-45.9	1.70	58-58.9	2.09
46-46.9	1.73	59-59.9	2.12
47-47.9	1.76	60-60.9	2.15
48-48.9	1.79	61-61.9	2.18
49-49.9	1.82	62-62.9	2.21
50-50.9	1.85	63-63.9	2.24
51-51.9	1.88	64-64.9	2.27
52-52.9	1.91	63° & higher, for discolored naphtha only	2.36

Note: Clear naphtha: 22 color; 10 lbs. vapor pressure, Reid method; 90% recovery; end point, 410°. Discolored naphtha: same specifications as for clear naphtha except color.

MID-CONTINENT

Posted by Stanolind Crude Oil Purchasing Co., Jan. 28, 1937

	(In Oklahoma-*Kansas)	(In North-North Central Texas)
Below 29	$1.06	$0.96
29-29.9	1.08	0.98
30-30.9	1.10	1.00
31-31.9	1.12	1.02
32-32.9	1.14	1.04
33-33.9	1.16	1.06
34-34.9	1.18	1.08
35-35.9	1.20	1.10
36-36.9	1.22	1.12
37-37.9	1.24	1.14
38-38.9	1.26	1.16
39-39.9	1.28	1.18
40 & above	1.30	1.20

Above Stanolind prices met as follows:

Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas. Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.

Note: Stanolind prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 99% tank tables are used, volume corrected to 60° F., and deduction for full b.s. & w. content.

*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.

In Oklahoma

(Effective Jan. 28, 1937)

Below 25	$0.98	33-33.9	$1.16
25-25.9	1.00	34-34.9	1.18
26-26.9	1.02	35-35.9	1.20
27-27.9	1.04	36-36.9	1.22
28-28.9	1.06	37-37.9	1.24
29-29.9	1.08	38-38.9	1.26
30-30.9	1.10	39-39.9	1.28
31-31.9	1.12	40 and above	1.30
32-32.9	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Barnsdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.

(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

Posted by Humble Oil & Refining Co.

TEXAS FIELDS

(*West Central Texas)

(Effective Jan. 28, 1937)

Below 29	$0.96	35-35.9	$1.10
29-29.9	0.98	36-36.9	1.12
30-30.9	1.00	37-37.9	1.14
31-31.9	1.02	38-38.9	1.16
32-32.9	1.04	39-39.9	1.18
33-33.9	1.06	40 and above	1.20
34-34.9	1.08		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Shell Petroleum Corp., effective Jan. 28, posts Humble's above schedule on Fisher county crude, plus these five lower grades, beginning with below 25 gravity at $0.88; 25-25.9, $0.90; 26-26.9, $0.92; 27-27.9, $0.94, and 28-28.9, $0.96; rest of schedule same as Humble's in West Central Texas.

†Effective Dec. 1, 1934, Humble prices are based on 99% tank tables at 60F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60F.

*East Central Texas

(Effective Jan. 28, 1937)

Below 29	$1.03	35-35.9	$1.17
29-29.9	1.05	36-36.9	1.19
30-30.9	1.07	37-37.9	1.21
31-31.9	1.09	38-38.9	1.23
32-32.9	1.11	39-39.9	1.25
33-33.9	1.13	40 and above	1.27
34-34.9	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.

Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

	Gray County	Carson-Hutchinson
Below 35	$0.96	$0.91
35-35.9	0.98	0.93
36-36.9	1.00	0.95
37-37.9	1.02	0.97
38-38.9	1.04	0.99
39-39.9	1.06	1.01
40 & above	1.08	1.03

Jan. 28, above prices met by Sinclair-Prairie and Magnolia in the entire area and by Continental in Carson-Hutchinson and by Texas Co. in Panhandle Sweet, same as Humble's Gray Co. and on Panhandle Sour, same as Carson-Hutchinson.

EAST TEXAS

(Effective May 22, 1937)
Stanolind, Humble, Shell, Sinclair-Prairie, Texas Co., and Magnolia $1.35

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco $0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex: Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company.

(Posted by The Texas Co., Jan. 28, 1937)

Cass County $1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

(Including Andrews, Crane, Crockett, Ector, Glasscock, Howard, Winkler and Upton Counties, Texas and Lea county, New Mexico).

Below 26	$0.78	33-33.9	$0.94
26-26.9	0.80	34-34.9	0.96
27-27.9	0.82	35-35.9	0.98
28-28.9	0.84	36-36.9	1.00
29-29.9	0.86	37-37.9	1.02
30-30.9	0.88	38-38.9	1.04
31-31.9	0.90	39-39.9	1.06
32-32.9	0.92	40 & above	1.08
Pecos, West Texas			$0.91

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winker.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil & Gas Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Artesia, Jackson and Maljamar pools, N. M. ... $0.90

COLORADO

(Posted by Continental Oil Co.,

Effective Jan. 28, 1937)

Ft. Collins and Wellington

Below 29	$1.01	35-35.9	$1.15
29-29.9	1.03	36-36.9	1.17
30-30.9	1.05	37-37.9	1.19
31-31.9	1.07	38-38.9	1.21
32-32.9	1.09	39-39.9	1.23
33-33.9	1.11	40 & above	1.25
34-34.9	1.13		

Cannon City and Florence, Col. $1.10

SOUTH AND SOUTHWEST TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski fields $1.09
Pettus ..... $1.37 Van Zandt $1.10

(Effective Nov. 1, 1936)

Heyser heavy ... $0.90 Placedo heavy .. $0.90
Heyser light ..... 1.15 Taft 0.95

Shell Pet. Corp. on Jan. 28, posted $1.09 in Salt Flat district, Tex.

Anahuac, Dickinson, Flour Bluff and Turtlebay

(Effective Jan. 28, 1937)

Below 31	$1.16	36-36.9	$1.28
31-31.9	1.18	37-37.9	1.30
32-32.9	1.20	38-38.9	1.32
33-33.9	1.22	39-39.9	1.34
34-34.9	1.24	40 and above	1.36
35-35.9	1.26		

Jan. 28, Magnolia met Humble in Darst Creek; posted $1.00 in Luling; $1.12 in Lytton Springs; $1.27 for Cleveland, Liberty county, Tex.; $1.15 in Hardin, Liberty county, Tex.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Posted by Humble

Conroe, Raccoon Bend, Tomball and Satsuma

(Deep sand crudes)
(Effective Jan. 28, 1937)

Below 29	$1.20	35-35.9	$1.34
29-29.9	1.22	36-36.9	1.36
30-30.9	1.24	37-37.9	1.38
31-31.9	1.26	38-38.9	1.40
32-32.9	1.28	39-39.9	1.42
33-33.9	1.30	40 & above	1.44
34-34.9	1.32		

Jan. 28, Magnolia met Humble in Tomball and Texas Co. met Humble in Conroe, beginning with 35-35.9 gravity.

Posted by Humble

Mirando, Heavy and Light

(Effective July 6, 1937)

Below 21	$0.96	31-31.9	$1.18
21-21.9	0.98	32-32.9	1.20
22-22.9	1.00	33-33.9	1.22
23-23.9	1.02	34-34.9	1.24
24-24.9	1.04	35-35.9	1.26
25-25.9	1.06	36-36.9	1.28
26-26.9	1.08	37-37.9	1.30
27-27.9	1.10	38-38.9	1.32
28-28.9	1.12	39-39.9	1.34
29-29.9	1.14	40 & above	1.36
30-30.9	1.16		

July 6, Magnolia posted same schedule as Humble in Mirando.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

(Continued on next page)

CRUDE OIL MARKETS

(Continued from preceding page)

NORTH LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(Effective Jan. 28, 1937)

(In Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie, and Miller county).

Below 25	$0.90	33-33.9	$1.08
25-25.9	0.92	34-34.9	1.10
26-26.9	0.94	35-35.9	1.12
27-27.9	0.96	36-36.9	1.14
28-28.9	0.98	37-37.9	1.16
29-29.9	1.00	38-38.9	1.18
30-30.9	1.02	39-39.9	1.20
31-31.9	1.04	40 and above	1.22
32-32.9	1.06		

Rodessa, La.

(Effective Jan. 28, 1937)

Below 25	$0.93	33-33.9	$1.11
25-25.9	0.95	34-34.9	1.13
26-26.9	0.97	35-35.9	1.15
27-27.9	0.99	36-36.9	1.17
28-28.9	1.01	37-37.9	1.19
29-29.9	1.03	38-38.9	1.21
30-30.9	1.05	39-39.9	1.23
31-31.9	1.07	40 and above	1.25
32-32.9	1.09		

Choctaw and Darrow

Jan. 28, 1937, initial posting; same schedule as Humble posts in Mirando, Tex., which see.

Smackover, Ark	$0.90
Urania, La. (La. Oil Refg. Co., Jan. 10, '36)	0.97
Tepetate, La. (Continental Oil, Jan. 28, '37)	1.24

Jan. 28, 1937, Magnolia met S. O. La.'s No. La.-Ark. gravity and price schedule in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., and in Eldorado and Rainbow districts, Ark.; and met S. O. La.'s Rodessa prices; and in Lockport, Iowa, Cameron Meadow, La., posted Humble's gravity and price schedule on Mirando.

Jan. 28. The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. and $0.90 for Smackover.

*GULF COASTAL FIELDS

Posted by Humble Oil & Refining Co. and The Texas Co.

	(Effective Jan. 28, 1937) Humble	Texas	Saxet (Humble) (July 6 '37)
Below 18	$0.95	$0.90	....
18-18.9	for	0.92	....
19-19.9	below	0.94	....
20-20.9	21°	0.96	$1.01
21-21.9	0.98	0.98	1.03
22-22.9	1.01	1.01	1.05
23-23.9	1.04	1.04	1.07
24-24.9	1.07	1.07	1.09
25-25.9	1.10	1.10	1.11
26-26.9	1.13	1.13	1.13
27-27.9	1.15	1.15	1.15
28-28.9	1.17	1.17	1.17
29-29.9	1.19	1.19	1.19
30-30.9	1.21	1.21	1.21
31-31.9	1.23	1.23	1.23
32-32.9	1.25	1.25	1.25
33-33.9	1.27	1.27	1.27
34-34.9	1.29	1.29	1.29
35-35.9	1.31	for	1.31
36-36.9	1.33	oil	1.33
37-37.9	1.35	34°	1.35
38-38.9	1.37	and	1.37
39-39.9	1.39	above.	1.39
40 and above..	1.41	....	1.41

Effective Dec. 1, 1934, Humble prices are based on 99% tank tables at 60F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60F.

*Includes these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss Bluff, Mykawa, Orange, Pierce Junction, Plymouth, Rabbs Ridge, Raccoon Bend (shallow sand), Refugio light and †heavy, Sour Lake, Spindletop, Sugarland and West Columbia. †Except these grades of Refugio heavy: effective July 6, 1937: Below 20, $0.95; 20-20.9, $1.01; 21-21.9, $1.03; 22-22.9, $1.05; 23-23.9, $1.07; 24-24.9, $1.09; and 25-25.9, $1.11; rest of schedule same as other Gulf Coastal crude.

Jan. 28, Sinclair-Prairie met above Humble schedule in full

July 6, 1937, The Texas Co. posted for Refugio: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

Greybull-Torchlight	$1.30
Iles, light, Col	1.18
Iles, heavy	1.12
Hogback, N. M	1.33
Big Muddy	1.23
Elk Basin, light	1.30
Grass Creek, light	1.30
Frannie light	0.82

(Effective Nov. 4, 1936)

Grass Creek, heavy	$0.62
Frannie heavy	0.62
Hamilton Dome, Wyo	0.57

Pondera, Mont., (Postings discontinued July 1, 1936, but Stanolind pays price posted by Ohio Oil for Kevin-Sunburst, less 20c per bbl.)

Posted by Ohio Oil Co

(Effective Jan. 28, 1937)

Elk Basin, Wyo	$1.30
Grass Creek, light	1.30
Rock Creek	1.205
Lance Creek	0.97
Sunburst, Mont	1.20

Posted by *International Refg Co.

Cut Bank, Mont.

(Effective Jan. 28, 1937)

Below 35°	$1.34	38-38.9	$1.42
35-35.9	1.36	39-39.9	1.44
36-36.9	1.38	40 and above	1.46
37-37.9	1.40		

*Texas Co. subsidiary.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Cat Creek, Mont	$1.40
Big Muddy, Wyo	1.18
Lance Creek, Wyo	0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936, and Elk Hills, effective June 22, 1936

Gravity	Signal Hill (Long Beach)	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills **Midway-Sunset	Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$0.80	0.79	0.74	0.78	0.79	0.80	0.76	....	....	0.80	0.76	0.76	0.77	0.78	....	0.70	....	0.70	0.70	0.65	0.70	0.70	....
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	.66	.74	.71	.70
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	.68	.78	.72	.70
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	.71	.82	.74	.70
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.89	.78	....	.77	.87	.87	.74	.86	.78	.72
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	.80	.92	.92	.77	.90	.82	.76
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	.80	.94	.86	.79
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	.83	.98	.90	.83
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	.86	1.02	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.96	1.06	.95	....	.95	1.10	1.10	.88	1.06	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	....	.99	1.15	1.15	.91	1.10	....	....
29-29.9	1.17	1.15	.93	1.18	1.18		1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	.94	1.14	....	....
30-30.9	1.21	1.19	.95	1.22	1.21		1.21	1.17	.95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	.97	1.18	....	....
31-31.9					1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	.99			
32-32.9		*Elwood	Terrace		1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.02	Kettleman	Hills	
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.04	....	1.19	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	....	....	1.23	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	....	....	1.27	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	....	....	1.31	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	....	....	1.35	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	....	....	1.39	....
39-39.9	....	....	....	....	....		..	1.61	....	....	....	....	1.40	....	....	....	....	....	....	....	....	1.43	....
40-40.9	....	....	....	....	....		....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	....	....	....	....

F. O. B. Standard Pipe Line

*F. o. b. ship.
‡Also McKittrick, Kern River, Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted. **Except Lakeview Area.

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Pure Oil Issue

CHICAGO, Aug. 23.—Details were announced today on Pure Oil Co.'s $44,240,000 issue of $100 par value cumulative convertible preferred stock.

The issue will have an initial conversion price of $22.22 2/9, and bear 5 per cent interest. Directors at a special meeting approved these details.

Application will be made for trading privileges on the New York stock exchange. Arrangement has been made by a group headed by Edward G. Smith & Co. to buy any new preferred stocks not subscribed for by the common stock holders.

New preferred stock will be offered to common shareholders of Sept. 3, and the offer will expire Sept. 24.

The conversion price will be in effect until Oct. 1, 1940. From 1940 for two years the price will be $25 a share, and for five years beginning Oct. 1, 1942 will be $30.

Pa. Refinery Lubricating Oil Inventory

(Issued as of Aug. 12 by National Petroleum Assoc.)

	Gallons
1. **Raw Long Residuum** (Including all raw long residuum below, and not salable, as 600 fire)	1,591,508
2. **600 Steam Refined** (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	9,734,877
3. **Other Steam Refined** (Not included in 1 and 2, above)	3,886,936
4. **Finished Dewaxed Long Res.**	2,447,239
5. **Bright Stock** (Does not include any material reported in 4, above)	12,571,815
6. **Viscous Neutral,** below 180 vis. but not below 142 vis. @ 100	8,600,429
7. **Viscous Neutral,** 180 vis. @ 100 and above	7,311,248

Coming Meetings

General Expositions

The Greater Texas and Pan American Exposition, Dallas, June 12 to Oct. 31.
The Great Lakes Exposition, Lake Front, Cleveland, Ohio, May 29 to Sept. 6.

Oil Meetings—Expositions

American Chemical Society, Rochester, N. Y., Sept. 6 to 10.
Kentucky Petroleum Marketers Assn., Annual Fall Conference and Golf Tournament, Louisville, Sept. 7 and 8.
Third Annual Bituminous Conference, Glacier National Park, Mont., Sept. 7, 8 and 9.
North American Gasoline Tax Conference, San Francisco, Calif., Sept. 13 to 16.
National Petroleum Assn., annual meeting, Hotel Traymore, Atlantic City, N. J., Sept. 15, 16 and 17.
Society of Automotive Engineers, regional tractor meeting, Mayflower Hotel, Akron, Ohio, Sept. 15, 16 and 17.
Pacific Oil Show and Black Gold Festival, Taft, Calif., Sept. 16 to 19.
Gasoline Pump Manufacturers Assn., Edgewater Beach Hotel, Chicago, Sept. 21, 22.
Oil Trades Assn. of New York, Sports Outing, Pelham Country Club, Pelham Manor, N. Y., Sept. 21.
Credit Men's Assn. of Eastern Pennsylvania, Philadelphia and Pittsburgh Petroleum Groups, Nittany Lion Inn, State College, Pa., Sept. 27.
National Assn. of Petroleum Retailers, fifth national convention, Powers Hotel and Exposition Park, Rochester, N. Y., Sept. 27 to Oct. 1.
American Gas Assn., 19th annual convention, Cleveland, Ohio, Sept. 27 to Oct. 1.
Society of Automotive Engineers, regional transportation meeting, Blackstone Hotel, Chicago, Ill., Sept. 29, 30 and Oct. 1.
Society of Automotive Engineers, Fuel and Lubricants Regional meeting, Mayo Hotel, Tulsa, Okla., Sept. 30 and Oct. 1.
Chicago Exposition of Power and Mechanical Engineering, New International Amphitheatre, Chicago, Ill., Oct. 4 to 9.
Ohio Petroleum Marketers Assn., fall conference, Hotel Carter, and golf tournament, Westwood Country Club, Cleveland, Oct. 6 and 7.
Society of Automotive Engineers, National Aircraft Production meeting, Ambassador Hotel, Los Angeles, Calif., Oct. 7, 8 and 9.
26th National Safety Congress and Exposition, Kansas City, Mo., Oct. 11 to 15.
National Oil Marketers Assn., Stevens Hotel, Chicago, Ill., Oct. 12, 13 and 14.
Oil-World Exposition, Inc., Houston, Texas, Oct. 11 to 16.
25th Annual Conference on Taxation, auspices New England State Tax Officials Association, Hanover, N. H., Oct. 15 and 16.
Independent Petroleum Assn. of America, Houston, Tex., Oct. 14, 15 and 16.
American Assn. of Petroleum Geologists, midyear meeting, William Penn Hotel, Pittsburgh, Pa., Oct. 14, 15 and 16.
American Institute of Mining and Metallurgical Engineers, Atlantic City, Oct. 18 to 23.
Michigan Petroleum Assn., Traverse City, Mich., Oct. 21 and 22.
National Tax Assn., 30th annual conference, The Lord Baltimore Hotel, Baltimore, Md., Oct. 25 to 28.
Indiana Independent Petroleum Assn., annual convention, Hotel Severin, Indianapolis, Oct. 27, 28.
Society of Automotive Engineers, annual dinner, Commodore Hotel, New York City, Oct. 28.
Mid-Continent Oil & Gas Assn. of Texas, annual meeting and convention, Dallas, Texas, Oct. 29 and 30.
National Automobile Show, Grand Central Palace, New York City, Oct. 27 to Nov. 3.
American Petroleum Institute, 18th annual meeting, Stevens Hotel, Chicago, Ill., Nov. 9 to 12.
Oil Trades Assn. of New York, New York, Nov. 16.
American Institute of Chemical Engineers, annual meeting, St. Louis, Mo., Nov. 17, 18 and 19.
National Asphalt Conference, Memphis, Tenn., week of Dec. 6.
Exposition of Chemical Industries, Grand Central Palace, New York, N. Y., Dec. 6 to 11.
Society of Automotive Engineers, National Production meeting, Hotel Durant, Flint, Mich., Dec. 8, 9 and 10.
Nebraska Petroleum Marketers, Inc., Omaha, Nebr., Dec. 7, 8 and 9.
American Chemical Society, Division Organic Chemistry, Richmond, Va., Dec. 28, 29 and 30.

1938

Northwest Petroleum Assn., North Dakota Division, Minot, N. D., Jan. 24 and 25.
Northwest Petroleum Assn., Minnesota Division, Hotel Radisson, Minneapolis, Jan. 27 and 28.
American Assn. of Petroleum Geologists, 23rd annual meeting, Roosevelt Hotel, New Orleans, La., March 16 to 18.
International Petroleum Exposition, Tulsa, Okla., May 14 to 21.

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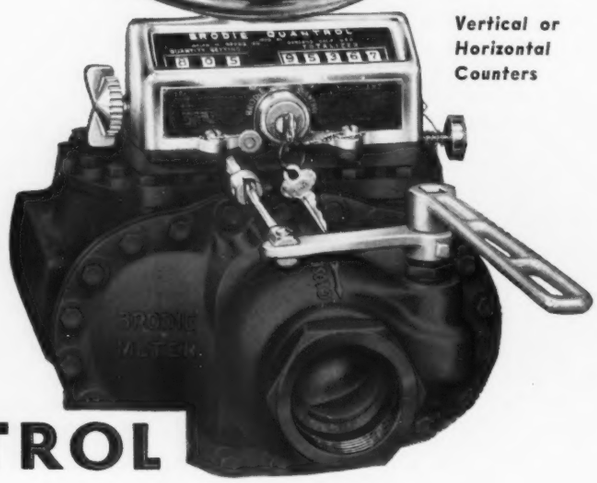
MAKE TANK-TRUCKS DO 25% MORE WORK



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Time saving is one of the most important benefits of automatic Brodie Quantrols. By effecting short-cuts and speeding-up each delivery operation, a Quantrol-equipped tank-truck will do an *eight hour job within six hours!* Thus it can be assigned to do 25% *more work.* In fleet operations four Quantrolized trucks can be depended upon to do the work ordinarily requiring five trucks. Being automatic, the Quantrol serves as a "mechanical brained helper" avoiding the need for an extra man at any time. The sureness, speed and flexibility with which a Brodie Quantrol handles, meters and records petroleum products makes these time-saving short-cuts possible and practical. The Brodie Quantrol is one of the most widely used measuring methods because it is one of the best.

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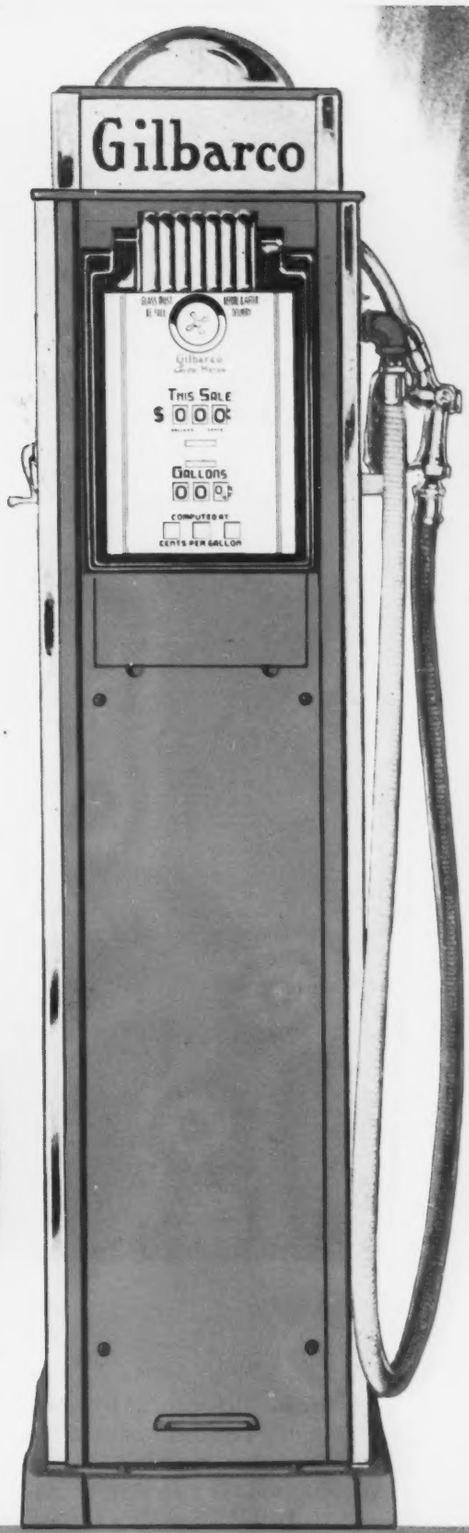
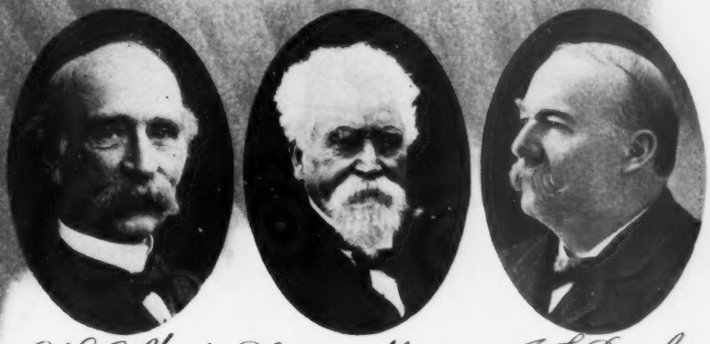


Leadership

based on 72 years of invention initiated by these three men



C. N. Gilbert Hiram Maxim J. F. Barker

In 1865, these three men started work on designs of a "gas machine." C. N. Gilbert as business man, Hiram Maxim (later to become famous as the inventor of the Maxim Machine Gun) as draftsman, and J. F. Barker as a wizard designer. A logical outcome of the pioneer work of these three men is the Gilbarco CALCO-METER of today.

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R. F. McCONNELL

R. F. McConnell, new assistant general manager of the general sales division of the Standard Oil Co. of Indiana, succeeding the late H. A. Lewis. He joined the company as a clerk in Detroit, in 1907. Promotions took him to Wichita and Grand Rapids and he returned to Detroit as manager of that office. In 1929 he was made assistant general manager of sales in field divisions.